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ABSTRACT

This study provides a model for assessing the library instructional needs of students in a selected scientific discipline, developing a program to meet those needs, and evaluating the results. Library research study units, which were integrated into an undergraduate course in the wildlife division, were presented in four 1-hour class sessions. Basic skills (classification systems, reading call numbers, the author/title card catalog, and the subject card catalog) were covered outside of the primary units via a self-paced exercise workbook which students were to complete after the first lecture. The four library research study units included lecture, discussion, and independent assignments covering publication sequence and popular/scholarly articles, indexes and abstracts, government documents, and known item searching. The narrative portion of this report discusses the impetus for the study and anticipated outcomes, research methodology, summary and evaluation of the library research study units, student evaluations, evaluation of the results, and conclusions. Appendices, which make up the major portion of the report, include: (1) full copies of all assessment tools developed and used during the study; (2) class lectures, handouts, and assignments for the study units and the self-paced workbook; (3) the performance exam designed to validate the test instrument; and (4) a 25-item annotated bibliography of literature examined during the study. (THC)

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FINAL REPORT FROM THE PUBLIC SERVICES RESEARCH PROJECTS

University of Arizona

Project sponsored by the General Electric Foundation

Office of Management Studies
Association of Research Libraries
Washington, D.C.
January, 1985

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Assessing the Instructional Needs of Students in a Selected Scientific Discipline at the University of Arizona

University of Arizona Library

Louise Greenfield, Principal Investigator
Jeanne Pfander
Chris Sherratt
Karen Williams

Office of Management Studies
Association of Research Libraries
Washington, D.C.
December 1984

Publishing Note

This study provides a model for assessing the library instructional needs of students in a selected scientific discipline, for developing a program to meet these needs, and for evaluating the results. We have therefore, adopted a format which will allow persons to make effective use of our model. The first section is the narrative report. Full copies of all assessment tools developed and used during the study and referred to in the narrative section are included in Appendix A. Appendix B contains the four Library Research Study Units. We have included the complete text of the class lectures, the handouts, the assignments, and the self-paced workbook on basic skills. Appendix C contains the performance exam designed to help validate our objective test instrument. Appendix D includes an annotated bibliography of the literature examined during the study.

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Assessing the Instructional Needs of Students in a Selected Scientific Discipline at the University of Arizona

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Abstract

This study assessed the library instructional needs of students at the University of Arizona in a selected scientific discipline and explored methods in which our instructional program could respond more effectively to these needs. Based on the results of this study, we developed an effective library instructional program for students in the selected scientific discipline. This process will serve as a model for exploring and assessing instructional needs in other science disciplines.

Introduction

Our study was designed to explore the basic issues of providing bibliographic instruction to students in a science discipline at a large university. It included developing a process to select the science discipline, as well as developing a process for exploring and assessing the instructional needs of students in the selected department. Another objective of the study was to diagnose students' specific areas of strength and weakness. As part of this study we communicated to faculty members the skills which we as librarians believed important for students to achieve. Equally important was our understanding of the expectations faculty members had for their students. It is hoped that the results of our work will serve as a model for other instructional assessment and development projects.

We have provided a model for instructional planning and faculty outreach which can be adapted by others interested in implementing instruction programs. We have also provided a model for collaboration between reference staff, instructional librarians, and teaching faculty. We have developed

methods to assist in assessment of instructional needs and to assist in evaluation of the results. We have drawn conclusions about the nature of scientific literature and communication, and formed opinions about how science students use libraries. We have also developed and implemented an instructional program which successfully fulfilled the objectives set by project team members and wildlife faculty.

The following description of the University of Arizona, the University of Arizona Library, and the Library Instruction program should help put this study into a meaningful context:

There are 30,000 students enrolled at the University of Arizona, almost 23,000 of them are undergraduates. Of these, 4,985 are freshmen. About three quarters of the students are from Arizona. There are eleven undergraduate colleges offering bachelor's degree programs. The average SAT verbal and math combined score for students is about 950. Students come from families of all income ranges. Within a four-year experience, about 50% of all students will receive some form of scholarship for financial aid.

The University of Arizona Library is a large research library. Our collection consists of almost 5 million items. We have 18 departments spread out over five different buildings, including a Main Library (Humanities, Social Sciences and Fine Arts), and a Science-Engineering Library (Applied and Pure Sciences). It is a large, resource-rich collection, but also a very complex facility.

The Library Instruction Department is responsible for planning, coordinating, and evaluating the programs to instruct students in effective use of the library. The actual instruction is done by librarians and career staff from throughout the library system.

Our program includes a Library Skills Program which is a self-paced workbook program administered to incoming freshmen through their English 101 classes (the first course in freshmen composition sequence). This program introduces students to basic library skills and concepts and familiarizes them with the resources, the organization and the services of the U of A Library. While we consider this the backbone of the instructional program, it is important to note that only 50% of the students who earn their undergraduate degree from the University of Arizona actually attend their freshman year at the University.

English 102 provides students an opportunity to further develop their writing skills. They also have the opportunity to develop and refine their research skills. Instructional sessions are offered to these students which are designed to introduce them to sources of literary criticism appropriate to their topic. These sessions are individualized and directed toward the work each class is studying. Emphasis is placed on when and how to use sources, where they fit in the research process, evaluation of sources, selection of the proper sources, and the organization of literature in the discipline.

The program for more advanced, upper-level instruction is done in the form of 50-minute course-related instructional sessions which are requested by faculty members and presented to undergraduate and graduate students in departments throughout the University. These instructional sessions are given by librarians with subject expertise. They introduce students to the major reference tools in the field, the access tools such as the card catalog, and important indexes and abstracts. Covered are such research techniques as developing a search strategy (the steps in the research process), and organizing concepts, such as the sequence in which information appears in publication.

Impetus for the Study

Several factors provided special impetus for this study at the University of Arizona. Within the state of Arizona and the University of Arizona there is a renewed interest in strengthening of science education. Despite this committment, the report of the Science-Engineering Library OMS Sponsored Planning Study (1) identified the following problem areas in the instruction program: 1) The study identified the lack of an adequate introduction to the Science-Engineering Library in the Library Skills Program; 2) The study identified a lack of emphasis on library use instruction in science courses.

Another factor entered into the decision to do this study. The Faculty Senate of the University of Arizona approved a program to ensure that student writing skills were assessed and developed throughout their college years. Included in this program were: 1) an Upper-Division Writing Proficiency Examination that helps determine the level of student readiness to do work in writing emphasis courses in their major fields; 2) the beginnings of a movement to establish a writing emphasis course in each major university department. (Successful completion of a writing emphasis course will be a requirement for graduation.)

The library staff was asked to develop and score a library research skills examination (2) which has been administered along with the writing proficiency exam since Spring 1983.

The examination was developed by librarians from throughout the library system and was based on a set of learning outcomes (3) developed by them as well. These objectives now serve as the basic objectives for the Library Instruction Program. These help to ensure consistency in the teaching of library skills and concepts by librarians and career staff throughout the University of Arizona Library.

This examination, a 30-question objective test, serves both as a diagnostic tool and as a tool to begin establishing university-wide standards

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(1) Final Report 1982-83 Planning Study, Science-Engineering Library, University of Arizona.

(2) Library Research Proficiency Exam available upon request, Library Instruction Department, University of Arizona.

(3) See Appendix A, pages 1-6.

for students' research skills. The exam, we determined, would give us a systematic method for evaluating the research skills of students in the chosen scientific discipline and the writing emphasis course could prove an ideal vehicle for placement of a library instruction unit. We also had a set of learning outcomes, or objectives, for the instruction program which could be explored with faculty members.

The above information should provide an overview of the University, the student population, the Library, the instruction program and the impetus for the study. The following will outline our anticipated outcomes and the research methodology.

Anticipated Outcomes

We anticipated several specific outcomes. They included a performance examination (4) designed to help validate the objective test instrument, a set of modified learning outcomes, a model instructional program (5) for students in the selected scientific discipline, with recommendations for integration of an instructional unit within the department's writing emphasis course, and a model process for exploring and assessing instructional needs of students in a selected scientific discipline.

We hoped that this study would focus more formal attention on the goals of our instruction program for upper level subject oriented students. The results of this study we hoped would allow us to strengthen our overall instruction program (e.g. Library Skills Program) as well as the instructional program directed to specific scientific disciplines. We believed grant team members involved in this program would increase their knowledge of sources in science and technology, their knowledge of the organization of scientific literature, and their understanding of the methods of scientific research.

Research Methodology

The grant period began officially in January 1984, however, preparatory work began in the summer of 1983 and continued into the fall semester. Our immediate task was to develop criteria for the selection of a department and develop a checklist to gather information relevant to the selection (6).

The OMS grant members met with the Science-Engineering reference librarians for assistance in the selection of a department. It was decided that these librarians would be a valuable resource in supplying some of the

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(4) See Appendix C.

(5) See Appendix D.

(6) See Appendix A, pages 7,8.

information on the checklist. Because science librarians work with science faculty and students, we assumed they would have familiarity with their research patterns, their curriculum, and their library related assignments.

Science librarians felt they would be especially helpful in answering the following questions: 1) Is this department representative? 2) Does the U of A Library have adequate holdings to support an instruction program for this department? 3) Are faculty members supportive and willing to cooperate? 4) What is the department's past library instruction history? 5) Do faculty members rely on themselves or on graduate students to do research? 6) What are your impressions of the methods or patterns of library use by scientists/students in this department?

It was decided that science librarians would respond to this checklist for the two or three departments with which they felt most familiar. It was understood that they could not respond to every item on the checklist. The departments science librarians most often chose were Geosciences, Mining and Geological Engineering, and Chemical Engineering. Their comments were taken into consideration as the selection process went on. An initial selection of nine departments was then made based on local factors, our criteria, and the guidelines of the grant. These were: Nutrition, Geosciences, Chemistry, Chemical Engineering, Mining and Geological Engineering, Civil Engineering, Hydrology and Water Resources, General Biology, and Wildlife and Fisheries and Recreation Resources. We charted the cumulated information and selected six departments for visitation. These were: Mining and Geological Engineering; Wildlife, Fisheries and Recreation Resources; Soils, Water and Engineering; Chemistry; Geosciences; Civil Engineering and Engineering Mechanics.

It was determined that an appointment would be made with each department head during which time the points on the "Interview Guide--Science Department Heads" (7) would be discussed. We decided that only by interviewing the department head would we get a firm idea of willingness to commit staff time to the grant project.

A member of the grant project team and a Science librarian were paired to make the visitations. One team member was primarily responsible for recording the department head's comments. The questions on the interview guide covered the following topics: Research; Faculty and the Library; Librarian's roles; Departmental courses and the Library; The future: professions, information needs.

The interview guide proved an effective tool to compare and contrast responses to the same questions. Some questions proved revealing. While

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(7) See Appendix A, pages 9,10.
(Spec Kit 101, User Studies in ARL Libraries, Washington. Office of Management Studies. February 1984.)

almost all department heads saw a need for students to learn research skills, many balked at the suggestion of including this in their undergraduate curriculum. While most agreed librarians should have a role in evaluating students' library skills, many denied librarians a role in teaching students how to evaluate information. We concluded our interviews by asking department heads if they would guarantee faculty time to work on the grant project.

Other elements were taken into consideration. In one case the department was going through organizational changes which rendered it too unstable for consideration. In another, students and faculty members spent too much time "in the field" to allow sufficient time for collaboration.

Insight was gained into the organization and composition of specific departments. In one case, a department head exclaimed, "We have so many oddballs, we do not hire them for their ability to communicate. They work independently and collaboration will have to be done individually and on an hourly basis." In libraries, so much work is done through the committee structure we can forget that not every department functions effectively in that manner.

While the main purpose of our visits was to choose the department most appropriate for this study, we did not see our interviews as terminal. We made clear to departments that this grant would be directed to one department, but we intended to build on our results and work with other departments in the future. As a result of our meeting, we have a clearer understanding of the departments' curricula, student research needs, and the research skills faculty members expect of their students.

Narrative reports were written and a summary report for each department was presented orally to the Science-Engineering reference staff. The final selection of the Division of Wildlife, Fisheries and Recreation Resources, School of Renewable Natural Resources was made by the grant project members with recommendations from the Science-Engineering Library staff. Important issues affecting the selection were:

- -The department is research oriented
- -All undergraduate course levels are represented
- -The library has an adequate collection to support programs in this area
- -The process of developing a program for this department would be transferrable to other disciplines in the sciences
- -There is an expectation of library skill levels, although students do not all come close to achieving them
- -Librarians are seen as having a role in teaching and evaluating students' research skills
- -Students in this Division are identified as having a need for library instruction.

We first met with the faculty members from the Division of Wildlife, Fisheries, and Recreation Resources in an open session with all members present. During this meeting we summarized the grant proposal, outlined the proposed timetable and suggested how we could proceed together. It was decided that we would meet in smaller groups to explore our list of

"Discussion Points," (8) a list of questions designed to promote open discussion and exchange of information and ideas. Because much of our discussion would focus on library concepts and skills, faculty members felt groups of at least three to five would be beneficial. They believed they could learn from their colleagues' thoughts and responses. Faculty members were given a copy of the grant, two readings on library instructional theory and practice, and a copy of the "Discussion Points." Course forms (9) were distributed to be filled out and returned prior to our next scheduled meeting. The discussion points were covered in three meetings during the following week. Grant team members met following these meetings to discuss, clarify, and record the information and issues which came from these sessions. Topics covered included use made in this field of professional societies, the information skills, other than library skills, they would like their students to learn (e.g. observation) and where they saw a library skills unit fitting into the Division.

Our next series of meetings focused on discussions of the learning outcomes. These learning outcomes, serve as a basic set of objectives for our instruction program. The purpose of these meetings was to communicate to faculty members the library skills which we believe are important for students to achieve. Equally important was to learn the research skills faculty members identified as being important to their students, and to understand the expectations they had for their students.

The general learning outcomes fall into the following broad categories:

1. Students will recognize various formats of materials from which information can be retrieved.
2. Students will recognize that materials are organized by a classification system.
3. Students will know how to use the tools which give access to information.
4. Students will know basic library terminology.
5. Students will apply library knowledge towards setting up effective search strategies.

We went step by step through our set of learning outcomes. In some cases much explanation was required. Faculty members were unfamiliar with certain skills we listed, with concepts such as search strategy, and with sources such as the Library of Congress Subject Headings.

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(8) See Appendix A, pages 11, 12.

(9) See Appendix A, page 13.

As a result of our collaboration, we were able to identify:

1. Skills and knowledge basic for students to have by the end of their sophomore year. These include: (attached in full) (10)
   a. Students will be familiar with the Science-Engineering facility and the Main Library.
   b. Students will understand that the materials are organized by a classification system based on subject.
   c. Students will locate material by call number in the library.
2. Skills and concepts which the grant project should directly include and teach students. These include: (attached in full) (11)
   a. Students will understand when and how to use indexing and abstracting services.
   b. Students will recognize government documents as an important source of information.
   c. Students will recognize citations to conference literature and can locate this material in the library.
3. Issues which should be considered when designing the model unit. These issues include: (attached in full) (12)
   a. Heavy use made of citation tracing.
   b. Emphasis on key people and key research.
   c. Cumulative nature of scientific literature.

In the 1984 Spring semester the Library Research Proficiency Exam and a brief survey (13) were administered to students just completing the sophomore/junior level Wildlife Management class. The responses to the survey (14) and an analysis of the test scores (15) provided us with additional information about the library research skills and needs of students in the Division of Wildlife, Fisheries, and Recreation Resources.

The students commented that they used the library mainly to gather information for class papers and projects, and to pursue their own interests in the field. Students made heavy use of journals and scientific indexes. Whild they acknowledged that these are very important sources of information, 42% of the students tested need to improve their skills in using these sources. According to the results of the proficiency exam, improvement is also called for in the areas of finding books that are arranged by call number, and using the card catalogs. These areas are very basic and must

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(10) See Appendix A, page 14.

(11) See Appendix A, page 15.

(12) See Appendix A, page 16.

(13) See Appendix A, page 17.

(14) See Appendix A, pages 18, 19.

(15) See Appendix A, page 20.

be mastered before students can put higher level skills to effective use. Although most students received a score of "adequate" in the area of constructing search strategies, many of them expressed a need to understand more about this process. A number of students stated that they needed to use government documents but had experienced difficulty finding them in the past. Responses to the question which asked how to make library instruction more interesting relayed an overwhelming desire to have the instruction relate directly to the subject area. This relationship should raise the interest level, which, in turn, should result in increased learning and retention of library research skills.

We also identified several conditions that we thought important to a successful program which we presented to faculty members. For example, we believed it was important that the units be presented in the first semester of the junior year to allow students to use the skills in later upper level courses. We also believed it was important to build in a mechanism for continued collaboration after the initial year (continued modification and reassessment). We also believed the units should be presented with faculty members present so library research skills would not be perceived to be separate from the curriculum, and while process is important, we believed the presentations must be brought home to their practical application--access points and emphasis on finding information.

All of these findings were taken into consideration when we decided where and how the Library Research Study Units would best be introduced to students in the Wildlife Division. It was decided that the Library Research Study Units be integrated into a 300 level course "Introduction to Wildlife and Fisheries Ecology." This course was team taught by two faculty members, one specializing in Wildlife and one in Fisheries. This is a required course of all four divisions in the School of Renewable Natural Resources. The units would be presented in four, one-hour class sessions. Each of the sessions were to be a week apart. The skills which were identified as being basic, were to be covered outside of the primary units. To accomplish this we developed a self-paced exercise workbook for students to complete after the first lecture. The workbook (16) covered classification systems, reading call numbers, the author/title card catalog, and the subject card catalog. The content of the four Library Research Study Units included publication sequence, popular/scholarly articles, indexes, government documents, and known item searching. Format included lecture, discussion, and independent assignments. We decided that each of the 37 students would receive a binder. Handouts and information would be added to it throughout the four sessions. Each skill or learning outcome which had been identified as needing to be taught directly would be addressed through one of the four units. The units were also developed around the considerations of how science students do research and their specialized information needs. For example, taking into consideration the fact that students do much known item searching and rely on key articles and research, we decided the unit on indexes would include more than the traditional "finding information." Use of indexes would also

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(16) See Appendix B, pages 1-25.

focus on narrowing a topic, the development of a list of key words, and finding information from related fields such as management, public administration, and law, as well as the basic life sciences.

Each grant team member developed one of the main units. Our responsibilities included lecture content, handouts, and assignments. Grant members met and critiqued each unit making suggestions and modifications. We informed Science-Engineering librarians of our progress and solicited their comment and review as well. Science-Engineering librarians responded to our assessment of the skills and concepts we wanted to teach, as well as to the design of the actual units. Various librarians informally assisted in the development of the units by introducing us to specific sources, clarifying Science-Engineering Library policies and answering questions about the collections.

The importance of continued collaboration among reference librarians, department faculty, and instruction librarians must be emphasized. For example, the unit on publication sequence was developed to address the following objectives:

-Students will be introduced to the sequence in which information appears in publications in the sciences,
-Students will learn how publication sequence reflects communication.
-Students will distinguish between primary and secondary sources, and popular and scholarly sources.

A graphic representation of publication sequence was presented to wildlife faculty with a detailed outline of the proposed unit. We thought it provided a much needed framework for students. The faculty members were less than enthusiastic. The objections were: too theoretical, it would not be considered relevant as outlined. The section was redesigned with greater emphasis on examples and familiar references based on their comments. Computer-assisted literature searching was discussed. Although several librarians felt it would be unthinkable to do a 1984 instructional unit and not focus on this topic, the faculty wanted it introduced and covered, but not emphasized. The faculty prefered that time be spent on fundamentals.

We met with SEL reference librarians once again after the units had been developed. At this meeting the content was summarized and the assignments the students would be given were described in detail. In addition to familiarizing staff with the four units, we believed they could assist us in working out procedures to ensure smooth implementation of the program.

Office hours were established for this first semester to provide students with an opportunity to get any needed clarification. The three grant team members each had one office hour per week. Science reference staff members were to refer any students who had questions they could not answer to team members during office hours. We assumed that such questions would involve material covered in class, the assignments, etc. It also provided an opportunity for us to identify any problems with the assignment which could be avoided in subsequent presentations. Science-Engineering

librarians were given a binder which included information on all four units, and the assignments and the handouts. They were also asked to note their reference desk experience with these students. A list of questions was included in the binder, such as:

1. Please note any poorly worded or ambiguous assignment questions.
2. What is the attitude of students who approach you? Are they interested? Bored? Negative? Challenged?

etc.

The basic skills workbook, text of lectures, handouts, and assignments are included in full in Appendix B. The following section provides a summary and evaluation of the Library Research Study Units.

SUMMARY AND EVALUATION
LIBRARY RESEARCH STUDY UNITS

SUMMARY AND EVALUATION OF WORKBOOK ON BASIC SKILLS

The research skills we intended to teach students in the four library units were all based upon prior knowledge of some very basic library skills. Since the students came to this class with a wide variety of library experience, we needed to make sure that they shared some common skills. To do this we adapted four chapters from the U of A Library's Library Skills Program workbook. These chapters included classification systems, reading call numbers, the author/title card catalog, and the subject card catalog. We realized that for some students this would be new material and for others it would serve as a review.

This resulting workbook is self-paced and was given to students during the first library unit. In each chapter, students are asked to read a short narrative which explains the given concept and presents examples, and then to complete an assignment. The narrative focused on the Science-Engineering Library and the examples all referred to wildlife and fisheries. Students were given one week in which to complete all four assignments. There are twenty different sets of assignments, all of which have students working with wildlife related materials. Having different assignment sheets encouraged students to work on their own and spreads usage out over more library materials. The answer sheets were compiled as the questions were written, so grading these assignments was very simple.

In grading we found that the great majority of students did not have any trouble correctly completing the assignments on classification systems and the two card catalogs, but they had some difficulty ordering call numbers. Only 22% of the students were able to correctly sequence all three sets of call numbers. Forty-three percent were understandably confused by the invisible decimal in the third line of the call number; but, alarmingly, 30% of the students seemed to have no understanding whatsoever of the basic concepts behind reading call numbers. These findings supported feelings previously expressed by SEL reference staff that many students are not finding materials in the stacks because they cannot read call numbers.

Several points pertaining to the development of this type of instructional tool should be stressed here. First, we noticed that a few students completed their assignments in the Main Library instead of the SEL. While this did not interfere with the learning process, it did not serve to make them more familiar with the building which they would be using most often (SEL). This also caused slight problems in the grading of the assignments since the answer sheets were keyed to the card catalog in the SEL. A comparison of the two buildings in the narrative may have led students to think that they could choose between them. We learned from this that directions can never be too clear, simple, and specific.

With this type of assignment, there is also always the possibility that cards will be added to or removed from the card catalog between the times when the answer sheets are compiled and the students actually come into the library. This means that if a student is asked, for example, to list the

call number on the first card under a subject heading, the student's answer may be correct but will not match the answer sheet.

The last caution is probably well known but bears repeating--proofread very carefully, especially if typing or other work was delegated to student assistants. Typos and other mistakes can confuse those students trying to learn from the text, especially if they occur in the examples.

The ordering of call numbers was discussed briefly at the beginning of the second library unit and examples were presented. Overall, the mini-workbook accomplished its purpose very well. We decided that nothing should be removed from it, and, in the future we would like to include a brief chapter on using the UA serials list and the SEL serials file.

SUMMARY AND EVALUATION OF UNIT I: INTRODUCTION AND OVERVIEW, PUBLICATION SEQUENCE, POPULAR/SCHOLARLY ARTICLES

Objectives:

1. Students will recognize the difference between popular and scholarly articles.
2. Students will recognize the difference between primary and secondary literature.
3. Students will be introduced to the sequence in which information appears in publications in the sciences.
4. Students will learn how publication sequence reflects communication.

Considerations:

1. Use is made of "invisible college."
2. Emphasis on "key people and key research."
3. Much material in this discipline is hard for libraries to collect.

This unit was designed to meet the above stated objectives and to take into account the above considerations. We also used this first session to introduce the four units and to motivate students by emphasizing the importance of knowing how to do effective library research.

Research skills were presented as being relevant to these students by introducing the following main points: the diversity of information from which wildlife managers must draw; their responsibility to make the public aware of wildlife issues and values; their future roles as problem solvers and decision makers; and their need for a knowledge of current wildlife principles and practices.

The diagram of publication sequence was effective in introducing students to new information and concepts. It also provided a framework to which students could refer back as the units progressed. Ideas such as how people in a field communicate with each other and the point at which information moves from the informal information network to a published format and is available in the library collection were important to their understanding of the organization of information in their field.

The distinction between popular and scientific literature was one wildlife faculty asked us to emphasize in our units. So, while the publication sequence diagram is convenient for explaining a number of different ideas, the popular literature concept was chosen to be outlined in detail.

The discussion of the distinction between popular and scientific articles made use of both the diagram, as well as two articles provided to the students in class. The diagram contrasted publication sequence for popular literature with the sequence followed for scholarly publications. The lecture pointed out distinctions between the two types of articles such as

methodology used, credentials of the author, references to early studies and literature cited, language, and tone, etc. All of these points would be repeated and reinforced through completion of the assignment.

This unit was successful in meeting its objectives. If anything, it suffered from over ambition in trying to include too much into a short period of time. When doing it a second time we would like to present the introduction and instructions for completing the preliminary exercises at an earlier date.

The section on publication sequence had been modified earlier at the request of Wildlife Faculty who found its original format too theoretical. The graphic presentations (circle handouts) were conceptually effective but a graphic failure. It was extremely costly to provide 37 students with the black/red color scheme. Two-color photocopy costs (exorbitant) had to be weighed against hours of student assistant time to hand draw them.

SUMMARY AND EVALUATION OF UNIT II: INDEXES AND ABSTRACTS

The objectives for the Indexes and Abstracts unit were well-defined and attainable. They were as follows:

1. Students will know journal articles are indexed in indexes and abstracts.
2. Students will be able to identify the components provided in a bibliographic citation in an index or abstract.
3. Students will be able to identify abstracting journals as appropriate tools for obtaining summaries of articles.
4. Students will know that citations within periodical indexes and abstracting journals are arranged by subject and author and, on occasion, other factors as well (geographic location, taxonomic classification, etc.).
5. Students will know which indexes and abstracts are appropriate for fisheries and wildlife management topics (both the biological and social aspects).
6. Students will be aware of the availability of online bibliographic databases relevant to fisheries and wildlife.

We believe that we met these goals in our presentation of the Indexes and Abstracts Unit. First, we defined the terms "index" and "abstract." We identified the basic components of a bibliographic citation. There was a general discussion of the reasons for using indexes and abstracts and some guidelines were given for narrowing down a research topic and developing a list of keywords. The lecture and handouts introduced a number of relevant indexes and abstracts, arranged by major emphasis (biological aspects, social science aspects, and general, popular approach). We then discussed in detail four of the most relevant "biological" indexes (Biological Abstracts, Biological and Agricultural Index, Wildlife Review, and Zoological Record). Finally, we listed in a handout the databases available for fisheries and wildlife management topics, and discussed in detail two of those (BIOSIS and ZooRecord).

In spite of the fact that the unit was successful, there are some minor changes and recommendations we would suggest to anyone doing this unit in the future:

1. Become familiar with the room that you will lecture in. This is important when you are going out of the library to give these units. The classroom in the Fisheries and Wildlife department had poor acoustics.
2. Proofread carefully all handouts at least a day before you give your lecture.
3. Spend less time on discussion of online databases than we did. At this point in their "career" these students are not likely to be able to make much use of the online search services at the library.

4. Include more reminders of how to locate journals in the UA Library.
5. Consider carefully the sample topic used to illustrate the use of the different indexes and abstracts. Even before we designed this unit there was discussion of whether to use a specific organism as a sample topic or a general wildlife or fisheries concept. This semester the use of the Gila Monster as the sample topic was appropriate because the final assignment required the students to research a particular animal. If however, the final assignment was oriented towards general topics in fisheries and wildlife management, a different sample topic in the handouts and the presentation would be called for.
6. Spend more time explaining the assignment.

SUMMARY AND EVALUATION OF ASSIGNMENT: DISTINGUISHING BETWEEN POPULAR AND SCHOLARLY ARTICLES/AND USING INDEXES AND ABSTRACTS

This assignment was given to the students following the lecture on indexes and abstracts. This gave students experience in locating journal articles through use of appropriate indexes, as well as determining the differences between scholarly and popular literature. Students did well in completion of the assignment, but seemed to have their greatest difficulty in finding two articles on a similar topic (one popular, one scholarly). Question J, which asked students to note any discrepancies in basic information presented between the two articles was not clearly understood by several students, and in the case where articles were not sufficiently parallel students could not answer this question at all.

SUMMARY AND EVALUATION OF UNIT III: GOVERNMENT DOCUMENTS

Objectives:

1. Students will recognize government documents as important sources of information.
2. Students will recognize and know how to use reference tools that lead to government documents.
3. Students will receive basic introduction to the SU Docs classification scheme and the agencies whose publications they will use most often.
4. Students will be made aware of existence of state and local documents.

Considerations:

1. Much material in this area is hard for libraries to collect (state and local documents).

The unit on government documents was developed to meet specific criteria as outlined by faculty, students, and librarians. The attitude survey given to wildlife students last spring revealed that many of them are confused by government documents and very hesitant to make use of them. They don't know how they are handled by the library, and therefore don't know how to find them. To overcome these feelings of hesitation and frustration, we conducted the session on documents in the Main Library, in a room nest to the Government Documents Department. At the end of the session, the students were taken into the reference area of the Department where the sources they would be using were pointed out to them.

The lecture opened with a definition of government documents and several examples were presented. We wanted students to understand the vast scope of topics addressed within government documents so the examples included everything from a booklet of fish recipes (to help overcome that feeling of "officialness" about documents), to research reports and environmental impact statements which would illustrate the relevancy of documents to the students' work.

The ways in which documents differ from other publications and the reasons why they receive special treatment were discussed in order to alleviate the mystery which sometimes surrounds them. Making students understand the importance of documents, and that they are often missed by the informal networks through which many scientists gather their information, should help to motivate them to come over to the Main Library to use these resources.

The criteria also stipulated that students should become familiar with specific sources, so the lecture included an explanation of the use of the Monthly Catalog and handouts described four other indexes. Comparisons were made to indexes with which the students were already familiar so that they would have a framework to which they could attach this new concept.

The ability to use library knowledge and skills to construct an effective search strategy was another important part of the criteria. To help students develop this ability, we discussed when government documents could be used to supplement other materials and when they might be the only source of information. As part of the assignment, the students were given a topic and requested to use the Monthly Catalog and one other index to find relevant documents. This gave them practice both at using specific indexes and constructing a small part of a search strategy.

For future presentations, we would change the unit in a couple of ways. We would include more information on and examples of state and local documents. The faculty had designated this as an area of lesser importance, but students still expressed frustration at having to locate state documents and requested more information about them. We would place greater emphasis on the differences between and the functions of the card catalog and the Monthly Catalog. Lastly, we would try to include some hands-on experience during the class session and make the following assignment slightly more sophisticated.

SUMMARY AND EVALUATION OF ASSIGNMENT: GOVERNMENT DOCUMENTS

Students had very little trouble completing the documents assignment. The questions which involved using the card catalog and reading SuDocs numbers were answered correctly by almost everyone. The last question, which gave them a topic and asked them to use the Monthly Catalog and one other index, provided their biggest challenge. The error made most often here was the listing of an incomplete citation, due to a lack of familiarity with government documents. Several students listed documents which were of questionable relevancy to the topic, which again emphasizes the problem students have in evaluating information.

SUMMARY AND EVALUATION OF UNIT IV: KNOWN ITEM SEARCHING

Objectives:

1. Students will distinguish citations in an index, e.g. book, journal, conference paper, government document.
2. Students will use the UA Serials List and/or Serials File to determine whether the library owns a specific serial or periodical.
3. Students will recognize citations to conference literature and can locate this material in the library.
4. Students will be introduced to Interlibrary Loan service.

Considerations:

1. Emphasis on "key people" and "key research."
2. Use is made of the "invisible college."

The Known Item Searching unit was begun by one grant member and completed by another. The second team member was responsible for developing the text from outline form and designing several handouts. Because the objectives were clear and the outline done so specifically, it did not present any difficulty. Recommendations had been made for handouts, inclusion of specific sources, as well as suggestions for the assignment.

This unit was presented by a nonteam member, a science reference librarian. We were most interested in determining how effectively a staff member could step into this project without benefit of earlier involvement. Her comments follow:

> "I enjoyed teaching the section on "Known Item Searching" especially because it is one of the major areas of confusion among students using the Science Library. You and your grant committee produced a well-organized script and outline that bound the 4 lectures into a cohesive whole. I did not feel I was lecturing in a vacuum but was part of a continuum, because of the well-organized notebook of materials, your orientation to me about my place in the program, and the intellectual continuity of the material presented."

Grant members agree that a nonmember could easily participate without any damage to the units' continuity. In preparation the presenter did sit in on the government documents unit which preceded hers, and had all unit materials available to her. In her presentation she was able to refer to skills, concepts, and information covered in earlier units.

While this unit was successful in meeting all of the stated objectives, grant project members had some recommendations for changes. It was determined that more concrete examples of the known item searching process should be included in the lecture. We believe that the handouts can stand on their own for use by students when they are in the library. The lecture should use specific examples and should focus on difficult and confusing known items, and should trace them step-by-step. While students definitly needed these skills explained, some perceived them as being repetitious or not necessary. Using concrete examples, we believe, will make the information more relevant and heighten student interest.

SUMMARY AND EVALUATION OF ASSIGNMENT: KNOWN ITEM SEARCHING

The assignment given after the Known Item Searching unit was the third assignment in the series of units.

We used the list of references that each student was to have photocopied from the scholarly journal article in Assignment I. We circled one reference on the photocopy of the bibliography or list of references which the student then was required to search for. The steps taken in this process were to be documented and if the library did own the item (not all of the references were to items we own) the student was required to photocopy the first page. We tried to give the students references that would test their knowledge of what had been covered in the Known Item Searching Unit (determining what type of publication a citation refers to, deciphering abbreviations, etc.). In addition, we had checked each one of the circled references ourselves, so we knew whether the library owns it and the problems (if any) associated with finding the item.

Overall, the students did very well on this assignment. One or two even complained that the assignment was too easy. Most students, however, thought the assignment was useful and made use of the handouts when doing the assignment. For the students who had difficulties with this assignment it was usually a problem of misunderstanding (not knowing which reference to search for) or incompleteness (not documenting their search process). Another "difficulty" we encountered was student resentment against being required to photocopy the first page of the item. This was also a problem in the first assignment when they were required to photocopy the bibliography from the scholarly article. The underlying cause of this resentment may have been the fact that the UA Library recently raised the standard photocopy charge from 5¢ per page to 10¢ per page, eliciting many complaints from the student community. In any case, we had several students who didn't photocopy the required pages in either assignment. (One student copied by hand the entire bibliography from the scholarly journal article in the first assignment!)

If we had to drop any of the assignments (Popular/Scholarly--Indexes and Abstracts, Government Documents, or the Final Assignment) this is the one we would leave out. It would decrease the level of student resentment against "library busy-work" and let them concentrate on the final assignment which was handed out at the same time. We feel that their work with the previous assignments and also the Final Assignment would give them opportunities to practice known item searching skills.

In any case, the assignment did serve its purpose. It showed that students do know how to determine what type of publication a citation refers to (journal article, book, conference paper, report, etc.) and how to find out if the library owns the item.

SUMMARY AND EVALUATION: THE FINAL ASSIGNMENT

The Final Assignment was designed to evaluate students' ability to apply the skills, concepts, and information learned through participation in this program. It was important that such an assignment be relevant to the course objectives and not perceived by students as a separate "library assignment."

Students were asked to choose a wildlife species such as Desert Bighorn Sheep and a life history trait such as disease or habitat requirements. Students were asked to simulate the role of a wildlife manager. They were to explain why the topic has importance to biologists or managers. They were asked to summarize recent and significant findings and to make management recommendations, assess future research needs, and forecast future conditions or needs. Students were directed to examine at least two scholarly journal articles, two government documents, and one conference proceeding. Sources were to be cited in the text of their papers as well as in a final bibliography. Students were directed to provide specific documentation of sources cited or examined.

The Final Assignment represented a compromise in both expectations and requirements. Librarians and wildlife faculty wanted a more ambitious assignment in which students would develop their own review article on a given topic. Several factors entered into our decision to scale the assignment down. Wildlife faculty members were concerned that the time students would need to do a satisfactory job on the review article would take time away from other course requirements. Such an assignment would, for example, require students to do in addition to library research more indepth reading, analysis, and evaluation of the material. Also, because faculty members were still unfamiliar with their students' research skills they chose to make a more conservative assignment.

To properly evaluate the "review article assignment," librarians and wildlife faculty would have to work more closely in the evaluation than was the case in the assignment actually given. While neither party saw this as a disadvantage, it was determined that a less complicated assignment might be better to begin the collaborative process. Librarians and wildlife faculty agreed that we could in the future, move in the direction of a more ambitious assignment.

The Final Assignment was graded jointly by grant team members and the two wildlife faculty members. While librarians commented on content, we supplied grades for the students' research performance only. Our evaluation was based on the following criteria:

1. Completeness of citations. 20%
2. Documentation of sources used to find references. 20%
3. Appropriateness (e.g. Reader's Guide is inappropriate) 20%
   of sources used &
   Appropriateness of articles located.

4. Documentation within the text--(facts, statistics, tables, conclusions, etc.) not general knowledge of field. 20%
5. Number and type of citations: 20%
   2 journals
   2 documents
   1 conference proceeding.

Each paper was read by two team members and a third if there was a large discrepancy in the grade assigned.

The majority of students were able to cite references accurately, however they had some difficulty with sources relatively new to them such as government documents and conference reports. Students would, for example, fail to include the issuing agency when citing documents or leave out the sponsor when citing conference proceedings. Students had little difficulty documenting the sources used to find their material, however 20% of the students did not read the directions carefully enough and failed to include this information at all. Over 50% of the students were able to find the required number and type of citations. Of the students who failed to cite the required sources, 50% noted that they examined but did not use such sources for their research paper. It was disappointing however, to find that many students stopped at the point where they had fulfilled the basic requirements of the research paper. While students used appropriate sources such as specialized indexes, they did not explore additional sources which might have yielded more pertinent or relevant information.

The Final Assignment was then scored by two wildlife faculty members who evaluated the papers for content and style. The two grades were averaged together for a final score. This final grade represented 20% of a student's overall course grade.

The average score for the library research portion was 79.52. The average score for the content and style portion was 90.40. The average combined score was 87.48. The librarians and wildlife faculty agreed there was a positive correlation between the content of the students' papers and their demonstrated research skills. We believe that discrepancies occured for only two reasons. Students who did not read or follow the assignment directions were unable to fulfill the documentation requirements and were scored down. Also, wildlife faculty members identified several students who had strong backgrounds in specific wildlife areas. They were able to include adequate content material in their papers doing only a minimum of library research.

It was clear from the students' performance that more time should have been spent describing the procedures for completing the final assignment. Although written instructions were crystal clear, students did not read the directions carefully.

Wildlife faculty members believed that they should have been more involved in presenting the assignment to students. While they contributed significantly to its development it was perceived by students as part of a "library unit."

Faculty members agreed that in the future they would take a more active role in presenting the assignment to students. They also suggested that they could bring a variety of articles in during the weeks of the Library Research Study Units and discuss them in class. They believed that by discussing various aspects of these articles, such as variety of sources cited, and citation format, they would be able to reinforce library research objectives.

Faculty members also suggested that students start from the first assignment with the topic they would consider for the Final Assignment. This would give students a greater opportunity to determine if they have selected a workable topic. We also discussed the possibility of students turning their papers in twice. The first version would be reviewed and critiqued by both librarians and wildlife faculty members. Students would then have an opportunity to refine their work based on these comments and suggestions.

STUDENT EVALUATION

Following is a compilation of the Library Research Study Units Student Evaluation. (17) This was administered to students during one of their class sessions. They had completed the Final Assignment before we asked them to comment on the overall program. Students were asked to respond to content, assignments, and handouts of each unit. We were also very much interested in determining if the students believed the units helped them with their research project, and if it would help them with future research projects. Another important factor was to determine if the units had an effect on student attitude toward using the library.

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(17) See Appendix A, pages 21-23.

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DIRECTIONS: Please answer each of these questions about each Library Research Study Unit presented.	1. Popular and Scholarly/Scientific Articles and Publication Sequence	2. Indexes and Abstracts
a) What did you find most informative about this unit?	Learned different ways to tell the difference between popular and scholarly articles. (9) Learned information about basic research. (1) Learned more about the Library of Congress system. (1) (This response was referring to the Preliminary Exercises.) Everything was presented beautifully. (1)	Showed different ways of using indexes and abstracts to find information. (15) Showed there is more variety of indexes and abstracts than previously thought. (1) Learned of the different abstracts and indexes available and their location. (1) Everything was presented beautifully. (1)
b) What did you find least informative about this unit? What would you delete?	Already knew the difference between popular and scholarly articles. (6 All information was useful and appreciated. (3) The homework assignment took too long to cover common sense information and differences. (2) More examples were needed. (3) The lectures were unnecessary because the information was all in the handouts. (1)	Delete nothing from the unit. (8) All information was needed, useful, and appreciated. (1) The lectures were unnecessary because the information was covered in the handouts. (1) The unit was redundant of Freshman English. (1)
c) How useful was the library assignment in reinforcing concepts covered in this unit?	The assignment was useful. (13) It was too simplified. (3) The assignment was not useful—busy-work. (3) The assignment was too long. (1)	The assignment was useful. (16) The assignment was too simplified. (1) The assignment was not useful—busy-work. (2)
d) Given the opportunity what would you add to the unit?	Everything was covered sufficiently.(7) Need more explanation about the GEAC terminals. (1) (This response was referring to the Preliminary Exercises.) Needed more information about Wildlife journals. (1) The handouts need to be simplified. (1) Need more information on using microfiche. (1) (This response was referring to the Preliminary Exercises.) Delete Unit I because there is no need. (1)	Everything was covered sufficiently. (6 Add more information on location and specific use of each index and abstract. (6)
e) Did you make use of any of the handouts? If yes, please explain.	Yes— (11) No— (7) Steps given in handouts were followed to find information—used as a guide. (3)	Yes— (18) No— (1) Steps given in handouts were followed to find information. (1) List of indexes was helpful. (2) Handouts were a bit confusing. (1)

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DIRECTIONS: Please answer each of these questions about each Library Research Study Unit presented.	3. Government Documents	4. Known Item Searching
a) What did you find most informative about this unit?	Learned different ways of locating government documents--card catalog, etc. (10) The information on Special Collections was helpful. (2) The unit presented information that was not previously known. (3) Interested in the wide variety of topics available in the government documents department. (1)	Learned different ways of looking for information. (6) The Unit was straight forward. (1) It was helpful to locate materials from a bibliography. (1) It was useful to learn about SEL Serials list. (1) The Unit provided good knowledge for future use. (2) There was nothing informative about this unit. (2)
b) What did you find least informative about this unit? What would you delete?	Delete nothing from the unit. (7) Add more information on state documents. (5) The handouts and lectures could have been more complimentary. (1) The lectures could have been shorter. (1) Give more information on things other than the Monthly Catalog. (1) The Government Documents Department was confusing. (1) The presentation was confusing. (1)	Delete nothing from the unit. (6) The unit was too basic. (2) Delete "The Nature of the Beast" section from the unit. (1) The material presented was redundant of Freshman English. (1) Delete the entire unit. (1)
c) How useful was the library assignment in reinforcing concepts covered in this unit?	The assignment was useful. (15) The assignment was not very useful. (2) Difficulty was experienced when trying to find a subject. (1)	The assignment was useful. (10) The assignment was not very useful. (3)
d) Given the opportunity what would you add to the unit?	Everything was sufficiently covered.(5) Add more indepth searching. (1) Add more practice with government documents. (3) Add more information about state documents. (4) Add more information about use of Special Collections. (3) This unit was the most difficult to understand. (1) Make sure subjects can be found in CIS or Monthly Catalog. (1) Make guidelines more direct--(this person hesitated to ask a reference librarian for help.) (1)	Everything was sufficiently covered.(8) Drop the unit. (1) The unit was too easy--make the books more difficult to locate. (1)
e) Did you make use of any of the handouts? If yes, please explain.	Yes-- (15) No-- (1) Step-by-step instructions were followed to find information. (1) Handouts will be kept for future reference. (2) Government documents would have been hard to locate without them. (1)	Yes-- (4) No-- (9) Students were already familiar with this information. (2) Step-by-step instructions were followed to find information. (1)

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1. How have these Library Research Study Units helped in preparing you for the Final Assignment?

   It helped me to find information more quickly than before. (11)
   The presentations were better than the previous Library Instructions sessions attended. (2)
   The assignments could not have been done without the units. (1)
   The units did not help--the information was already known. (2)
   The units gave more knowledge about the library and how to use it. (3)

2. What topics were not covered that should be added? (Types of sources, services, etc.)

   Everything was covered sufficiently. (5)
   Other areas to cover: Use of GEAC terminals (3)
   General library services (1)
   Loan procedures (1)
   Computer Searches, ILL, methods, costs, etc. (2)
   More information on indexes, government documents, Special Collections, (3)
   Use of Microfilm. (1)

   Do not add any more information to the units that could be obtained by asking a reference librarian. (1)

3. Have these Library Research Study Units changed your attitude toward using the Library? If so, please explain.

   Yes-- (10) (These students indicated a more positive attitude toward using the library.)
   Now that students are more knowledgeable about how to use the library they will use it more. They are more comfortable and familiar with the library. (6)
   The units made the library simplier to use. (1)
   Student is more critical of the sources used for research. (1)
   Turned off to government documents because of frustration largely due to lack of knowledge about state documents. (1)
   Student developed a "negative" attitude about library research. (1)

4. How will this Library Research Program help you in the future?

   The program will help with future writing assignments. (6)
   The program gave a better understanding of the library. (2)
   The program was useful and will carry over to other areas of study. (1)
   Better research skills were developed. (8)
   Handouts will be kept for future reference. (3)

5. Additional comments:

   The program took too much class time. The handouts would have been sufficient. (4)
   The program presenters were very knowledgeable about the information and were willing to help in any way. (1)
   Library Skills should be a separate course offered for undergraduate credit. (1)
   It would be better to include all the handouts in the folder at the beginning of the program. (1)
   Students met with frustration because of the lack of material owned by the UA Library on their subject and the overall lack of information available on their topics.(2)
   Not enough time was given to complete the assignments. (1)
   Grading process was unfair--late papers were given equal credit as those turned in on time. (2)
   The three-hole punch was off. (1)

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Evaluation of the Results

We met with the Science-Engineering Library staff to get their impressions on the success of the grant project. Staff members were asked a series of questions (18) and encouraged to make any additional comments. Their reactions were varied, but they agreed on several points.

They attributed the fact that there were no major problems at the reference desk to the open lines of communication between grant project members and Science-Engineering Library staff. They also reported that they felt well informed at all stages of the project. The procedures of one assignment caused some trouble, but because the reference staff was well prepared the difficulty was easily cleared up. Reference staff also reported that there was some frustration among students when the library did not own the items they wanted.

When asked what they had found most valuable about Science-Engineering Library staff involvement in the project, several areas were mentioned. Most of the Science-Engineering librarians enjoyed the visits we made to department heads and felt that these visits opened lines of communication between science departments and the Science-Engineering Library. They also felt that these students would be better prepared to use the library in the future. Several librarians thought that the prototype created through the grant project would be very useful in the future to other research libraries, and on a refined scale, to our library system.

There was recognition among Science-Engineering Library staff members that the grant project, due to the large investment of time required to carry out such a model program, could not easily be repeated. They agreed elements of the project would be utilized whenever appropriate, for example handouts, the Faculty Interview Guide, learning outcomes, and other assessment tools.

Science-Engineering staff members saw changes in their roles as the grant progressed. They were active in developing criteria and selecting the department. When grant team members devised the individual Library Research Study Units however, they were asked for their comment and review but were not asked to actively participate in the designing of the units.

It was pointed out that because the project ran so smoothly, some of the accomplishments may not be readily apparent but will be realized in the future. Among those named were increased communication between the Library Instruction Department and Science-Engineering Library staff, and increased communication between librarians and science faculty.

We met with the two faculty members who team-taught Introduction to Wildlife and Fisheries Ecology after the Final Assignment had been graded. They were provided with a Faculty Evaluation Form (19) before the meeting

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(18) See Appendix A, pages 24, 25.

(19) See Appendix A, pages 26, 27.

which served as a guide for discussion. We discussed the collaborative process, the implementation of the units, as well as the students' performance on the Final Assignment. (Evaluation of the Final Assignment is covered in the Summary and Evaluation--Library Research Study Units section.)

Both faculty members agreed that their time involved in the grant project was time well spent. They thought it was necessary to have all division faculty members involved initially in the process of defining objectives. This provided an opportunity to set division-wide standards for basic library skills. Once their course had been selected as the course for placement of the library component, they saw it as their responsibiliy to keep their colleagues informed of our progress, decisions, etc.

Developing written objectives and ensuring continued communication proved important. As a result of the effectiveness of the Library Research Study Units, we have been asked to continue this as a component of Introduction to Wildlife and Fisheries Ecology. This is a core course which all students in the School of Renewable Natural Resources must take. As a result of the Library Research Study Units, the curricula of Fish Management and Liminology have been altered. Faculty members made these modifications knowing that students have had a research skills foundation. We believe such changes were made because faculty members had participated in the process, had knowledge of the written objectives, and were familiar with the results of the program. Departmental collaboration also reduces the risk of a program being discontinued because one key person leaves.

Faculty members believed that students should not be involved in the planning process or determining objectives. Both faculty members indicated that students' primary responsibility should be during the implementation period, for example, they should be questioning points which are not clear.

Faculty members saw the value of the collaborative process to us. They believed our awareness of such elements as course content, students' professional aspirations, subject areas basic to wildlife study, etc. contributed to our ability to design the program with real relevance to students in this division.

Faculty members saw a very strong relationship between their own support and attitude toward the study units and their students' attitudes. They felt a need to be more demonstrative in their "in class" involvement. This point came clearly into focus around the issue of class assignments. Faculty members stated that they were generally concerned that students get their work done and not bothered by late papers. They observed, however, that when they applied this philosophy to the Library Research Study Units students thought the assignments were not all that important.

While the faculty members were present at each session they volunteered that the situation required much more. They suggested that in the future they would take advantage of opportunities in their own lectures to reinforce points, concepts, and ideas presented in the Library Research Study Units as well as build in more opportunity for carry over. It was significant that through their participation in the program, faculty members became so keenly aware of the need for a continued and deliberate effort before students can see library skills as an integrated part of their curriculum.

The impact of this project on the UA Library collection (specifically the Science-Engineering Library) has been a positive one. Increased dialogue with the departmental faculty and contact with the wildlife students as they worked on their assignments has led to increased awareness of our collection's strengths and weaknesses in the fisheries and wildlife management areas.

Part of the basis for choosing to work with the Wildlife & Fisheries Department was the fact that we do already have a good strong collection in those subject areas. The collection development policy of the UA Library (Policy and Procedures Memo. 6-79) states that the Library will collect materials on a comprehensive level in Fish Culture and Fisheries, Wildlife Management and other relevant areas (Animal Culture; Hunting, Camping, Outdoor life; Zoology; Natural History; Nature Conservation; etc.). Our profiles with the approval plan companies reflect this policy. A measurement of the shelf list in the SH and SK classes alone show that we have approximately 1550 titles in fisheries and wildlife. If you also include QH 75-77, QH 540-549, and QL (Nature Conservation, Ecology and Zoology) then the total number of titles we have in fisheries, wildlife and related life science areas comes to 11,000 titles. This, of course, does not include government documents or titles in the social sciences that would be relevant.

In spite of the fact that we have a strong collection to support fisheries and wildlife studies we realize that there are bound to be gaps in our collection. In the early part of this project the Science Acquisitions Librarian met with the faculty members of the Wildlife and Fisheries Department and reminded them of the UA Library's desire and need for their input on book and journal acquisitions. The approval plans were explained and the book ordering process was outlined. Since that meeting the Science Acquisitions Librarian has noticed a slight increase in the number of book and journal requests coming from the Fisheries and Wildlife faculty.

One of the main types of publication that seems to "fall through the cracks" fairly often (and this is generally true of any subject area) is the conference/symposia/workshop literature. We continue to make every effort to acquire this body of literature when it can be identified. As we worked on developing the assignments and in student contacts at the reference desk we came across several conference proceedings that we did not own. These were promptly ordered.

In conclusion, the Science-Engineering Library has a renewed sense of committment to support study and teaching in fisheries and wildlife sciences and related fields. They are confident that their collection is already adequate to this task, but have benefited from the project and the impetus it gave to developing a collection that will truly meet the needs of the students and faculty in the Wildlife and Fisheries department.

Approaching this project without having a scientific background presented both advantages and disadvantages to the two grant team members from the Library Instruction Department. One of the biggest advantages was not having any preconceived ideas about what usually goes on in instructional units for science students. We could contribute a few fresh ideas and assess the situation from a slightly different point of view. We were able to fully comprehend the interdisciplinary nature of the wildlife program. We think that all of this contributed to a well rounded set of goals and objectives for the unit. When it came time to write the lectures and assignments, we had to break down the information into its most basic components for ourselves so we were able to produce clear and concise materials for students.

One disadvantage was the inability to speak in scientific jargon with the faculty. We spent a little bit of time clarifying what each group was referring to when using terms like "statistics" and "welfare factors." However, the faculty was equally as ignorant of library jargon and we found them to be more than willing both to explain themselves and question us whenever necessary.

The biggest disadvantage was lack of knowledge about the subject field itself. We did extensive research into what kinds of courses students in this major are required to take, what kinds of jobs they get after graduation and the minimum requirements for these positions, what different divisions are within this field, what other fields does it draw on, what are the major professional associations and how to they fit into the picture, and so on. We also did some reading of articles and textbooks on wildlife and fisheries so that we would have some familiarity with the content of this particular course. This was a time consuming process, but it did prove beneficial in subsequent talks with faculty and students, and when it came time to write relevant assignments. Grading the final assignments provided a challenge. Assessing the relevancy of publications to a topic was not always easy, especially when much scientific terminology was involved. We consulted the science team member or searched the reference books whenever we did not understand terms or concepts.

Grant team members learned a great deal about the organization of scientific literature and the research patterns of scientists. We gained insight into the instructional needs of science students. Such knowledge proved immediately applicable to the grant team member who was in the midst of revising the Science-Engineering Library chapter of our Library Skills Program Workbook.

Developing this project under the auspices of a grant provided special advantages. Team members had predetermined "committed hours" which allowed us to devote time to aspects of the grant such as evaluation. Such areas are often pushed aside when more immediate concerns intrude. When there is no "grant" we recommend that when one begins such a project, a projection of hours per week be determined. These hours should be as sacred as reference desk hours or any other time committment. The grant gave us a credibility and status which was helpful in our initial contact with department heads. However, it was primarily the time and service committment which was important to them. Such committment should be negotiated with library administration prior to faculty contact. Additional student assistant time for typing, photocopying, record keeping, etc. should be planned for, as well as an additional increase in supplies and materials budget.

Wildlife faculty were especially concerned that this project have ongoing support. Faculty members agreed to work with librarians with the understanding that such a unit would be implemented, evaluated, modified, and presented again based on our mutual assessment. For faculty members to commit their personal and class time to such a project they felt it was important that it go beyond the "one shot" session. Again departmental and administrative support for instruction is essential to the success of such projects.

Conclusions

As a result of this study we have produced a model for library instructional assessment, planning, implementation, and evaluation. People involved in library instruction have a model process to draw on when developing criteria for the selection of a department or group, when interviewing faculty members, when designing their units, etc.

We have provided insight into the collaborative process among grant team members, reference staff, instructional librarians, and faculty members. Results of the grant stress the critical importance of effective communication.

We have designed, presented, and analyzed a working instructional model. This analysis includes evaluation of strengths and weaknesses, recommendations for improvement, and faculty and student evaluation.

This study produced a model of successful librarian and teaching faculty collaboration. This process included working with faculty members developing written objectives for library skills, determining their placement in a college division curriculum, developing format and content of the units, designing assignments, and evaluating student performance.

In the future we will use our increased knowledge of instructional assessment, planning, implementation, and evaluation to strengthen both our Library Skills Program and our upper-level instruction program. We intend to work with the members of several of our library departments so they can use our model process and materials when doing their own faculty outreach and instructional assessment. We will make use of our increased understanding of the organization and use of scientific literature and how science students use the library. We will work toward continued validation and modification of our objective test instrument. We will continue our collaboration with the Division of Wildlife Fisheries and Recreational Resources. We hope to use our model and experience to target writing emphasis courses in certain departments for possible placement of a library skills component.

APPENDIX A:

Assessment Tools

General Learning Outcomes

1. Recognizes various formats of materials from which information can be retrieved.

2. Recognize that materials are organized by a classification system.

3. Know how to use the tools that give access to information.

4. Know basic library terminology.

5. Apply library knowledge towards setting up effective search strategies.

These general learning outcomes were then discussed in terms of Specific Learning Outcomes.

1. Recognizes various formats of materials from which information can be retrieved.

   Students will recognize that newspapers, magazines, and books may all be found on microfilm or microfiche.

   A. Distinguishes between various forms of print materials.

      1. monographs (books)

      2. journals - bound and unbound

      3. microforms

   B. Knows locations for these.

2. Recognizes that materials are organized by a classification system.

   A. Understands that classification is based on subject.

   Students will know that the system used to assign call numbers is based on subject.

   B. Recognizes that related subject material is arranged together by call number.

      Students will understand that call number and subject are related.

   C. Knows how to use a call number to locate material on the shelf.

      1. Distinguishes between Dewey Decimal and Library of Congress call numbers.

      2. Matches the call number to the appropriate bookstack location.

3. Recognizes that call numbers are sequential (students can put in order a series of LC call numbers).

   Given a series of call numbers, students will determine if the sequence is correct.

   Students can find a book by call number in its correct shelf position.

4. Recognizes the existence of special library location symbols.

3. Knows how to use the tools that give access to information.

A. Knows when to use the card catalog.

1. Uses the card catalog to determine what books the library owns.

   Given a citation including an authors name, students will select the a/t catalog under author to determine if the Library has the cited item.

   Given a list of books by author and title, students will choose the a/t card catalog to determine if the Library owns these books.

B. Knows how to use the card catalog.

1. Recognizes that the card catalog lists books by author, title, and subject.

   Students will select the a/t catalog under author to determine if the Library has the cited item.

   Given a list of books by author and title, students will choose the a/t card catalog to determine if the Library owns these books.

   Students will know materials in the card catalog are arranged by subject, author and title.

   Students will select as false the option that it is necessary to know the author of a book to determine if the UofA Library owns it.

   Given a list of books by author and title, students will choose the a/t card catalog to determine if the Library owns the book.

   Given the author and title of a book, students will choose the a/t card catalog to determine if the Library owns the book.

Students will select call number as the system by which books are not arranged in the card catalog.

2. Identifies the various parts of a card.

Students will identify the call number on a card in the card catalog.

Given a list of sources, students will select the Library's card catalog to locate the publisher of a book owned by the Library.

C. Selects the subject card catalog as the most appropriate tool for locating books on a subject.

Given a topic, students will select the subject card catalog as the most efficient way to determine which books the Library owns on the topic.

D. Understands the importance in searching of specific controlled vocabulary (authority list) as contained in the LC Subject Headings.

1. Recognizes legitimate subject terms, cross references, and subdivisions.

Given an entry from the Library of Congress Subject Heading volumes, students will select the correct subject headings.

2. Relates acceptable subject terms in LC to subject headings in the card catalog.

Students will select the Library of Congress Subject Headings to find the subject headings used for a given topic in the card catalog.

E. Selects periodical indexes and abstracting services as the appropriate tool for locating articles.

Students will know journal articles are indexed in periodical indexes.

1. Knows that citations within periodical indexes are arranged by subject and author.

Given the subject and author of a recent journal article, students will select an index as the most appropriate source to locate a given journal citation.

2. Recognizes that different indexes are appropriate for different disciplines.

   Given a particular topic, students will select the periodical index covering information relevant to their topic.

   Given a list of sources students will select a periodical index appropriate to their topic.

3. Identifies the components provided in a bibliographic citation in an index.

   Given a standard Wilson journal citation (with numbered elements, and several choices), students will identify the following components: volume of the journal, title of the journal, and page on which article appears.

   Students will recognize the journal title in a journal citation.

4. Selects abstracting services as appropriate tools for obtaining summaries of articles.

F. Distinguishes between a book citation and journal citation.

   Students will identify information in a standard book citation.

   Students will correctly identify a standard journal citation.

   Students will select a citation to a journal article from among other types of citation.

G. Knows how to determine if the library owns a specific serial or periodical.

1. Knows how to determine if the library owns a specific serial or periodical by using the UA Serial/File.

   Students will select the UA Serials List as the source for complete journal holdings in the UA Library.

   Students will select the UA Serials List looking under title of journal to determine if the Library owns the cited item.

   To determine if the UA Library owns a journal, students will select the UA Serials List as the most appropriate source because it includes journal holdings.

2. Interprets information on the UA Serials List.

   Students will identify the call number on a card in the card catalog and students will match the call number to the appropriate bookstack location.

3. Uses information from Serials List/File to locate issues or volumes in the library.

H. Knows how to use the common components of reference tools (such as indexes, tables of abbreviations, cross references, bibliographies, etc.)

4. Knows basic library terminology.

5. Applies library knowledge towards setting up effective search strategies.

A. Recognizes the different types and levels of information available in the library.

1. Distinguishes between popular and scholarly treatment of a given topic.

   When given a standard journal citation, students will recognize that they can use the title of an article, the length of an article, and the source journal, to assist them in determining if the article is directed toward a popular or scholarly audience.

   Students will select a citation to a popular periodical article.

2. Distinguishes between primary and secondary research material.

   Students will select encyclopedia articles as <u>not</u> a form of primary research materials.

3. Recognizes that statistics can be an information source of support.

4. Recognizes that some topics will be researchable only in the most current sources; that some topics will be researchable only in older sources; and that some topics are "timeless."

5. Recognizes the U.S. government documents can be an important source of information for topics in the sciences and social sciences.

   Students will select U.S. government documents as a good source of information in the social sciences and sciences.

6. Distinguishes between general and in-depth treatment of a given topic.

B. Determines the appropriate types or levels of information necessary to develop a given thesis.

1. Determines whether scholarly or popular information is appropriate for a given topic.

2. Determines whether primary or secondary material is appropriate.

3. Determines if statistical sources are appropriate.

4. Determines how current the information needs to be.

5. Determines if U.S. government documents are appropriate for a topic.

6. Determines whether general or in-depth treatment is appropriate for a topic.

C. Having chosen the types and levels of information necessary to support a thesis, the students will select specific reference tools to get at those types and level of information.

1. Determines which reference tools will lead to general or specific information.

2. Determines which reference tools will lead to scholarly or popular information.

3. Determines which reference tools will lead to primary or secondary research material on a given subject.

4. Determines which reference tools will lead to statistical information on a given subject.

5. Determines which reference tools will lead to very current, as well as older, information on a given subject.

6. Determines which reference tools will lead to information on a given subject in government documents.

7. Knows that bibliographies will lead to additional information.

Given a topic, students will select a bibliography at the end of a journal article to provide references to further information on the topic.

D. Determines the appropriateness of various reference sources.

E. The student will recognize the need (if such a need arises) to revise (narrow, broaden, or otherwise alter the focus of) his thesis, based on the amount and/or the content of the information available in the library.

CRITERIA FOR SELECTION OF DISCIPLINE/DEPARTMENT

Is this discipline/department representative? (For example, course offerings from 100-499)

Does the U of A Library have adequate holdings to support an instruction program for this discipline/department?

Is the discipline/department research oriented?

Academic Research?

Research in the fields or professions?

If we choose this discipline or department will there be a high degree of transferability to other fields?

Are Faculty members supportive and willing to cooperate?

INFORMATION RELEVANT TO THE SELECTION

How many Faculty members are there in this department?

How many students are enrolled in this department? Major?

Is this discipline/department emerging or established?

Is this discipline/department dependent on related fields for its research or is it more focused?

On what field(s) is it dependent?

What is the departments past library instruction history?

Do Faculty members rely on themselves or on graduate students to do research? If so, how heavily?

What are your impressions of the methods or patterns of Library use by scientists/students in this discipline/department?

Do they use trade publications:

What is the difference in needs between academic research and job research?

What kind of grants does this discipline/department receive?

What are the sources of their research ideas?

e.g. Self

Literature

Colleagues (local)

Colleagues (elsewhere)

Are scientists/students in this discipline/department more dependent on older literature (20 years) or on the current literature (5-6 years) in their field?

Interview Guide-Science Department Heads

*1.Describe the nature of research in this department.
-Academic research
-Research for the field or profession
-Cooperative research projects

2. Where does this research fit along the basic-----applied continuum?

3. What other disciplines does _____ draw on? In what kinds of ways?

Faculty and the Library

*4. How and when do you use the library?

*5. What are your other methods for gathering information?
-for in-depth research papers?
-to maintain current awareness?
-for use in teaching?

6.(if not already mentioned) What use is made of the invisible college?

Students and the Library

*7.How and when do your students use the library?

8. What library skills do you expect your students to have?

9.. How close do the students come to achieving these skills?

10. (What skills do you think the students have acquired already?)

11. Are there other information-gathering skills you think the students need? If so, what kinds of skills?

Librarians' Roles

*12. Describe how you view the librarian's role in supporting the teaching function of this department.

13. What other roles, if any, do librarians have in supporting this department?

14. Do librarians have a part in evaluating students' research skills?

15. Do librarians have a part in teaching students how to evaluate information?

Departmental Courses and the Library

16. How much of a need is there to teach certain reference tools?

17. How great a need is there to include within this department's curriculum the teaching of library research strategies?

*18. In which of your departmental courses are library research skills being taught?

*19. In which of the courses do faculty members make library related assignments? What kind of assignments are made?

20. Describe other courses, if any, in which library skills could be usefully taught.

21. What types of grants have been awarded to this department? For what sorts of projects? Describe recent grant awards and current activities in this area.

The Future: Professions, Information Needs

22. What kinds of jobs do students with Bachelor's degrees get?

23. How many of these students go on to Graduate School?

24. What kinds of jobs are offered to graduate students after their advanced work in academics?

*25. What kinds of information -gathering skills will students need in their future professions? What kinds of information will they need? What will they need to know how to obtain?

Discussion Points

1. What subject areas are basic to the field of Wildlife study?

2. What kinds of literature do you use?

3. What kinds of literature do your students use?

4. When and how do you use the University of Arizona Library?

5. When and how do your students use the University of Arizona Library?

6. What information gathering skills other than library skills do you want your students to learn?

7. Do you believe there are certain skills which they should not be taught as undergraduates?

8. Who do you think should teach library skills to students?

9. Do you see a library skills unit fitting into this division?

10. How, when, and for what reasons do professionals in this field conduct searches for information?

11. What use is made of professional societies?

    publications

    current issues and trends

    communication with colleagues in the field

12. What are your sources of research ideas?

    scientific literature

    colleagues

    other

Course Description

Faculty Member's Name:

Course name and number:

Number of students enrolled:

Grade level of students: (Junior, senior, etc.)

What percentage of Wildlife Division majors take this course?

What are the major content areas covered by this course?

What research assignments are made in this course?

What library research skills are needed by students for this class?

Please attach a copy of your course syllabus or outline.

Please attach a copy of your course reading list.

Please attach a copy of any library related assignments.

After meeting with the faculty in the Division of Wildlife, Fisheries and Recreation Resources, we have created a list of skills we think are basic for students to have by the time they are juniors. The unit which we all will produce will build upon these skills and will not directly concentrate on them. Instead, these skills will be treated in a different way from the primary unit - perhaps as a review of a background module. These are:

1. Students are familiar with the SEL facility and the Main Library.

2. Students understand that the materials are organized by a (classification) system based on subject.

3. Students can locate material by call number in the library.

4. Students can distinguish Dewey Decimal and Library of Congress call numbers. (Students recognize a government document) call number.

5. Students know meaning of special location symbols for material within the library collections.

6. Students can use the author/title card catalog to determine whether the library owns a particular book.

7. Students can use the subject card catalog, the cross references in the catalog, and the Library of Congress Subject Headings to locate books on a subject.

8. Students know the important parts of a catalog card which can identify and locate the item.

We have also identified these skills and concepts which we think the grant project should directly include and teach to students. These are:

1. Students understand when and how to use indexing and abstracting services.

   a. Students are made aware of major indexes and abstracting services within the discipline and also those outside wildlife studies which cover related areas.
   b. Students are taught how to use certain major indexes in the field of wildlife studies.
   c. Students understand the parts of indexed citations.
   d. Students can distinguish citations in an index, e.g. book, journal, conference paper, government document.
   e. Students can use the UA Serials List and/or Serials File to determine whether the library owns a specific serial or periodical.

2. Students recognize government documents can be important sources of information.

   a. Students recognize and know how to use reference tools that lead to government documents.
   b. Students receive basic introduction to the SU Docs classification scheme and the agencies whose publications they will use most often.
   c. Students are made aware of existence of state and local documents.

3. Students can recognize citations to conference literature and can locate this materials in the library.

4. Students recognize statistics can be an additional source of information.

   a. Students are aware of sources which lead to statistics.

5. Students are introduced to appropriate books such as dictionaries or handbooks.

6. Students can recognize the differences between popular and scholarly, and primary and secondary literature.

   a. Students can identify features of these types of literature.

7. Students are introduced to Interlibrary Loan service.

At present, we also think the concept of publication sequence could be useful to students.

Two sources of material which might be mentioned but are less of a priority are legal sources and theses.

Considerations

The following are some of our observations which we think merit consideration as we design our model unit.

- Students rely on textbooks for a good deal of information.
- Heavy use of journals, also documents.
- Much material in this area is hard for libraries to collect.
- Heavy use made of citation tracing.
- Primary place for learning library skills is in the 4-year, B.S. degree
- Emphasis up until present time has been on the information 'product,' not the information-gathering process.
- The field and the literature used is very interdisciplinary.
- Library-use has been assignment oriented.
- Emphasis is given in the program to communication skills, both oral and written.
- Use is made of "invisible college."
- Many students enter this program at the junior level; several students transfer into the program at this level.
- Students make use of the small wildlife department collection, the personal reprint files and libraries of professors, and the librarian-staff person in the fisheries co-op unit.
- Emphasis on currency.
- Emphasis on "key people" and "key research."
- Cumulative nature of scientific literature.
- Students work well in groups as well as independently.

STUDENT SURVEY

1. As a Wildlife major for what reasons have you used the library?

2. What kind of information do you get from the library?

3. What skills do you wish you had in order to use the library more?

4. What library skills do you have that you find most helpful?

5. How do you think teaching about research and library skills could be made interesting?

6. What are your most frequent problems in using the library?

SUMMARY OF SURVEY

Below is a brief summary of the responses to the survey administered to Dr. Mannen's Wildlife Management class on Monday, April 30. Beneath each question is a list of any relevant responses and an indication of how many students made the same response. Some responses did not address the question and have not been included here.

1. As a Wildlife major for what reasons have you used the Library?

   -to do research for class papers (21)
   -to do personal reading in student's own area of interest (12)
   -studying (5)
   -use Reserve Book Room (3)
   -find government documents (2)
   -use the Map Collection (1)
   -for pleasure reading (1)

2. What kind of information do you get from the Library?

   -journal articles (8)
   -books (5)
   -information related to specific wildlife subjects (4)
   -scientific information (3)
   -background information (3)
   -all kinds (3)
   -facts and figures (data) (2)
   -newspapers (1)
   -field guides (1)
   -primary research material (1)

3. What skills do you wish you had in order to use the Library more effectively?

   -ability to use indexes (7)
   -ability to use GEAC (5)
   -how to find the right reference materials (4)
   -how to find government documents (3)
   -how to use the card catalog (2)
   -how to formulate search strategy (our wording) (1)
   -how to locate books on the shelf (1)
   -overall knowledge of library functions (1)

4. What library skills do you have that you find most helpful?

-can use the card catalog (7)
-can use GEAC (5)
-can use indexes (5)
-can use the Serials List (4)
-can physically locate a book or journal (2)
-can read citations (1)
-knowledge of subject headings (1)
-knowledge of where to begin a research project (1)
-can evaluate usefulness of article from title or abstract (1)

Students also mentioned patience, common sense, interest, and willingness to ask a librarian for assistance.

5. How do you think teaching about research and library skills could be made interesting?

-use a subject students are interest in (9)
-actually have to go through the steps with exercises (3)
-keep it short (2)
-impossible (2)
-make a special manual (workbook) for wildlife students (1)

6. What are your most frequent problems in using the Library?

-materials are checked out or not on shelf when needed (5)
-research is time consuming (4)
-needed materials not owned by library (3)
-difficulty locating appropriate journal articles (2)
-copy machines don't work well (2)
-government documents are hard to locate (2)
-microforms are hard to use (2)
-hours are bad (1)
-personnel impolite (1)
-not knowing where to begin research (1)
-not understanding cataloging and filing rules (1)
-not knowing where specific materials are located (1)
-other students are noisy and eat in the library (1)
-not knowing what is available in the library (1)

One comment that the librarians are very helpful.

Assessment Statements

Library Research Skills

Proficiency Examination

1. **Recognizes that materials are arranged by a subject classification system and knows how to use call numbers to locate materials on the shelf.**

Good Performance	5	(Number of students in each category.)
Adequate Performance	7	
Needs Improvement	9	

2. **Knows when and how to use subject headings and the card catalog.**

Good Performance	3	(Number of students in each category.)
Adequate Performance	7	
Needs Improvement	11	

3. **Knows when and how to use periodical indexes and the U of A Serials List.**

Good Performance	10	(Number of students in each category.)
Adequate Performance	2	
Needs Improvement	9	

4. **Can identify the elements of a bibliographic citation.**

Good Performance	13	(Number of students in each category.)
Adequate Performance	3	
Needs Improvement	5	

5. **Can apply library knowledge towards setting up effective search strategy.**

Good Performance	1	(Number of students in each category.)
Adequate Performance	16	
Needs Improvement	4	

Students who completed the Library Skills Program	7
No Instruction	14

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Please answer each of these questions about each Library Research Study Unit presented.	1. Popular and Scholarly/Scientific Articles and Publication Sequence	2. Indexes and Abstracts
a) What did you find <u>most</u> informative about this unit?		
b) What did you find <u>least</u> informative about this unit? What would you delete?		
c) How useful was the library assignment in reinforcing concepts covered in this unit?		
d) Given the opportunity what would you add to the unit?		
e) Did you make use of any of the handouts? If yes, please explain.		

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Please answer each of these questions about each Library Research Study Unit presented.	3. Government Documents	4. Known Item Searching
a) What did you find most informative about this unit?		
b) What did you find least informative about this unit? What would you delete?		
c) How useful was the library assignment in reinforcing concepts covered in this unit?		
d) Given the opportunity what would you add to the unit?		
e) Did you make use of any of the handouts? If yes, please explain.		

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1. How have these Library Research Study Units helped in preparing you for the Final Assignment?

2. What topics were not covered that should be added? (Types of sources, services, etc.)

3. Have these Library Research Study Units changed your attitude toward using the Library? If so, please explain.

4. How will this Library Research Program help you in the future?

5. Additional comments:

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Questions for Science-Engineering Librarians

1. Did students seem adequately prepared to complete their assignments?

2. Were there any assignments students seemed to have a great deal of difficulty with?

3. Did you feel familiar enough with the grant project to answer questions at the reference desk? (procedures, assignments, etc.) Was there information about the grant project in relation to the four presentations and assignments that we should have communicated and did not?

4. Did you see students with green OMS binders in the reference area who did not ask questions at the desk?

5. What did you find most valuable about your involvement?

6. Having mentioned your involvement, what changes would you make if we were to do it all again? (Too much involvement, too little involvement, more communication, etc.)

7. We have been asked to continue this unit--to present it again in the Fall of 1985. How do you see it being continued? How do you see your role?

8. How do you see using this model for your own faculty outreach and instructional responsibilities?

FACULTY EVALUATION

Process

How would you assess your time involvement in this project?

How important was it to have all department faculty members attending the preliminary meetings?

How effective was our process in identifying the objectives for the Library Research Study Units?

Should students have participated more in the process? Please explain.

Implementation

How successful were the units in meeting the stated objectives? (attached)

Are there any objectives you would now change?

Please comment on any elements in the four Library Research Study Units you would delete, modify, etc.

Student Performance

Please comment on student response to the Library Research Study Units.

How would you assess student performance on the Final Assignment?

APPENDIX P:

Library Research Study Units

CHAPTER ONE
CLASSIFICATION SYSTEMS

Most of the library's materials are organized by two main classification systems. You will need to understand the Library of Congress and the Dewey Decimal classification systems to use the library effectively.

THE ORGANIZATION OF BOOKS

In the library, books are arranged on the shelves by **call number.** The call number is a classification code which identifies the subject of each book. Each book in the library has its own unique number. Books on the same or similar subjects are labeled with similar call numbers that will place them in the same shelving areas. There are classification numbers for books dealing with general subjects such as "zoology"and classification numbers for more specific subjects such as "bighorn sheep".

In the University Library, books can be found under two different classification systems: 1) **Library of Congress** and 2) **Dewey Decimal.** The library's entire collection used to be in the Dewey Decimal System, but since 1967 all new books have been classified in the Library of Congress system because it is more suitable for a large research library. This means that on any given subject, the library may have books in both classifications.

Library of Congress Call Numbers

The code for Library of Congress call numbers is made up of three parts:

Example: QL
737
U53
B47

1. The letter or letters on the first line that identify the general subject; (QL)
2. the numbers on the second line that identify subtopics; (737) and
3. the letter-number combination on the third (and sometimes fourth) line which makes the subject even more specific (U53) and indicates the author of that particular book (B47)

Each catalog card for a book will show the call number for that book. The call number or classification code is the entire set of letters and numbers in the upper left hand corner of the card.

call number

QL
737
U53
B47

Berger, Joel
Social development and reproductive strategies in bighorn sheep / by Joel

Example:

Q is the classification for science in general

QL
737
U53
B47

QL is the classification for zoology - one of the sciences

QL 737 stands for systematic divisions of mammals by order and family

QL 737 U53 stands for bovidae

B47 stands for Berger, the author of the book

A date is often added as part of the call number:

QL
737
U53
B47
= first edition of the book by Berger

QL
737
U53
B47
1981
= a new and revised edition of the same book by Berger

General Subject Outline of the Library of Congress Classification System

A = GENERAL WORKS & POLYGRAPHY
- AC - Collections, Series
- AE - Encyclopedias
- AG - General reference works
- AI - Indexes (General)
- AM - Museums
- AN - Newspapers
- AP - Periodicals
- AS - Societies, Academies
- AY - Yearbooks (General)
- AZ - General history of knowledge and learning

B = PHILOSOPHY & RELIGION
- B - Collections, History, Systems
- BC - Logic
- BD - Metaphysics
- BF - Psychology
- BH - Aesthetics
- BJ - Ethics
- BL - Religions, Mythology
- BM - Judaism
- BP - Islam, Bahaism, Theosophy
- BQ - Buddhism
- BR - Church history
- BS - The Bible
- BT - Doctrinal Theology
- BV - Practical Theology
- BX - Special sects

C = AUXILIARY SCIENCES OF HISTORY
- CB - History of civilization & culture (General)
- CC - Archaeology
- CD - Diplomatics (Collections of documents, etc.), Archives, Seals
- CE - Chronology
- CJ - Numismatics, Coins
- CN - Epigraphy, Inscriptions
- CR - Heraldry
- CS - Genealogy
- CT - Biography, biography as an art, general collections, and individuals not identified with any country. (Note: Biographies and autobiographies are generally found under particular subjects and under names of countries, cities, etc.)

D = HISTORY & TOPOGRAPHY (Except America)
- D - General history
- DA - Great Britain
- DB - Austria-Hungary
- DC - France
- DD - Germany
- DE - Classical antiquity
- DF - Greece
- DG - Italy
- DH-DJ - Netherlands (Belgium, Luxemburg, Holland)
- DK - Russia, Poland, Finland
- DL - Scandinavia
- DP - Spain and Portugal
- DQ - Switzerland
- DR - Turkey & the Balkan States
- DS - Asia
- DT - Africa
- DU - Australia & Oceania
- DX - Gypsies

E & F = AMERICA (HISTORY & GEOGRAPHY)
- E - America & U.S. (General)
- F - U.S. (Local) & America except U.S.

G = GEOGRAPHY & ANTHROPOLOGY
- G - Geography (General)
- GA - Mathematical & astronomical geography
- GB - Physical geography
- GC - Oceanography
- GF - Cultural geography
- GN - Anthropology, Ethnology, Ethnography
- GR - Folklore
- GT - Manners & customs (General)
- GV - Recreation, Sports, Games

H = SOCIAL SCIENCES & SOCIOLOGY
- H - Social sciences (General)
- HA - Statistics
- HB - Economic theory
- HC - Economic history & conditions, National production
- HD - Economic history: agriculture & industries
- HE - Transportation & communication
- HF - Commerce (General)
- HG - Finance
- HJ - Public finance
- HM - Sociology (General and theoretical)
- HN - Social history, Social reform
- HQ - Sex relations, Family, Marriage, Home, Women
- HS - Associations (Secret clubs, societies, etc.)
- HT - Communities, Classes
- HV - Social problems
- HX - Socialism, Communism Anarchism, Bolshevism

J = POLITICAL SCIENCE
- J - Documents
- JA - General works
- JC - Political science, Theory of the state
- JF - Constitutional history (General)
- JK - United States
- JL - British America, Latin America
- JN - Europe
- JQ - Asia, Africa, Australia, and Pacific Islands
- JS - Local government
- JV - Colonies & colonization, Emigration & immigration
- JX - International relations

K = LAW

L = EDUCATION
- L - General works
- LA - History of education
- LB - Theory and practice of education, Teaching
- LC - Special forms, relations, and applications
- LD - Universities and colleges, U.S.
- LE - Universities & colleges, America except U.S.
- LF - Universities & colleges, Europe
- LG - Universities & colleges, Asia, Africa, Oceania
- LH - University, college, and school magazines, etc.
- LJ - College fraternities and their publications

M = MUSIC
- M - Music (Scores)
- ML - Literature of music
- MT - Music instruction & study

N = ART
- N - Fine arts (General)
- NA - Architecture
- NB - Sculpture & related arts
- NC - Graphic arts in general, drawing & design, illustration
- ND - Painting
- NE - Engraving, Prints
- NK - Art applied to industry, Decoration & ornament

P = LANGUAGE & LITERATURE
- P - Philology & linguistics (General)
- PA - Classical languages and literature
- PB - General works and Celtic
- PC - Romance languages
- PD - Scandinavian languages
- PE - English language (General) Anglo-Saxon & Middle English
- PF - Dutch, Flemish, Afrikaans, and German languages
- PG - Slavic languages and literatures
- PH - Finno-Ugrian & Basque
- PJ - Egyptian, Coptic, Semitic
- PK - Indo-Iranian, Indo-Aryan, Iranian, Armenian
- PL - East Asian, African
- PM - Hyperborean, American, & artificial languages
- PN - Literary history and collections (General)
- PQ - Romance literatures
- PR - English literatures
- PS - American literature
- PT - Germanic literatures
- PZ2001 - Science fiction (U of A)

Q = SCIENCE
- Q - Science (General)
- QA - Mathematics
- QB - Astronomy
- QC - Physics
- QD - Chemistry
- QE - Geology
- QH - Natural history
- QK - Botany
- QL - Zoology
- QM - Human anatomy
- QP - Physiology
- QR - Microbiology

R = MEDICINE
- R - Medicine (General)
- RA - Public health, Medical geography
- RB - Pathology
- RC - Practice of medicine, Psychiatry
- RD - Surgery
- RE - Opthalmology
- RF - Otology, Rhinology, Laryngology
- RG - Gynecology & obstetrics
- RJ - Pediatrics
- RK - Dentistry
- RL - Dermatology
- RM - Therapeutics
- RS - Pharmacy & materia medica
- RT - Nursing
- RV - Botanic, Thomsonian and eclectic medicine
- RX - Homeopathy
- RZ - Other systems of medicine

S = AGRICULTURE
- S - Agriculture (General)
- SB - Plant culture (General)
- SD - Forestry
- SF - Animal culture
- SH - Fish culture & hatcheries
- SK - Hunting and camping

T = TECHNOLOGY
- T - Technology (General)
- TA - Engineering (General), Civil engineering
- TC - Hydraulic engineering (harbors, rivers, canals)
- TD - Sanitary and municipal engineering
- TE - Roads and pavements
- TF - Railroad engineering and operation
- TG - Bridges
- TH - Building construction
- TJ - Mechanical engineering and machinery
- TK - Electrical engineering
- TL - Motor vehicles, Cycles, Aeronautics
- TN - Mineral industries, Mining Metallurgy
- TP - Chemical technology
- TR - Photography
- TS - Manufactures
- TT - Trades, Handicrafts
- TX - Home economics

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U = MILITARY SCIENCE
- U - Military science (General)
- UA - Armies, Organization and distribution
- UB - Administration
- UC - Maintenance and transportation
- UD - Infantry
- UE - Cavalry
- UF - Artillery
- UG - Military engineering, Air forces
- UH - Other services

V = NAVAL SCIENCE
- V - Naval science (General)
- VA - Navies, Organization and distribution
- VB - Naval administration
- VC - Naval maintenance
- VD - Naval seamen
- VE - Marines
- VF - Naval ordnance
- VG - Other services of navies
- VK - Navigation, Merchant marine
- VM - Shipbuilding, and marine engineering

Z = BIBLIOGRAPHY & LIBRARY SCIENCE

Dewey Decimal Call Numbers

The Dewey Decimal system divides all knowledge into ten different categories, which are then assigned number ranges. Subtopics of a general topic are identified by a more specific number within the general range.

639.92
D37 Dasmann, William
Deer range : improvement and

Example:
600 - 699 = technology
630 - 639 = agriculture and related industries
639 = nondomesticated plants and animals
639.9 = conservation of biological resources
639.92 = habitat improvement for animals

The second line of a Dewey Decimal classification number is the author code.

Example: 639.92
D37 = Dasmann, William (author)

Subject Outline of the Dewey Decimal Classification System

000 = 099 GENERAL WORKS
- 000 - Generalities
- 010 - Bibliographies & catalogs
- 020 - Library & info. sciences
- 030 - General encyclopedic works
- 050 - General serial publications
- 060 - Gen. organizations & museology
- 070 - Journalism, Publishing, Newspapers
- 080 - General collections
- 090 - Manuscripts and book rarities
- 470 - Italic languages/Latin
- 480 - Hellenic/Classical Greek
- 490 - Other languages

100 = 199 PHILOSOPHY & PSYCHOLOGY
- 100 - Philosophy & related disciplines
- 110 - Ontology & methodology
- 120 - Knowledge, Cause, Purpose, Man
- 130 - Pseudo- & parapsychology, occultism
- 140 - Specific philosophical viewpoints
- 150 - Psychology
- 160 - Logic
- 170 - Ethics (Moral Philosophy)
- 180 - Ancient, Medieval, Oriental philosophy
- 190 - Modern western philosophy

200 = 299 RELIGION

200 - Religion
210 - Natural religion
220 - Bible
230 - Christian doctrinal theology
240 - Christian moral theology
250 - Local Christian church and orders
260 - Christian social theology
270 - Christian church history
280 - Christian denominations and sects
290 - Other religions & comparative

300 = 399 SOCIAL SCIENCES

300 - Social sciences/Sociology
310 - Statistics
320 - Political science
330 - Economics
340 - Law
350 - Public administration
360 - Social pathology and social services
370 - Education
380 - Commerce
*390 - Customs & Folklore

400 = 499 LANGUAGE

*400 - Language
*410 - Linguistics
*420 - English & Anglo-Saxon languages
430 - Germanic languages/German
440 - Romance languages/French
450 - Italian, Romanian, Rhaeto-Romanic
460 - Spanish & Portuguese languages

500 = 599 PURE SCIENCES

500 - Pure sciences
510 - Mathematics
520 - Astronomy & allied sciences
530 - Physics
540 - Chemistry & allied sciences
550 - Sciences of earth and other worlds
560 - Paleontology/Paleozoology
570 - Anthropological and biological sciences
580 - Botanical sciences
590 - Zoological sciences

600 = 699 TECHNOLOGY

600 - Technology (applied sciences)
610 - Medical science/Medicine
620 - Engineering & allied operations
630 - Agriculture and related industries
640 - Domestic arts & sciences
*650 - Managerial services
660 - Chemical and related technologies
670 - Manufactures
680 - Miscellaneous manufactures
690 - Buildings

700 = 799 THE ARTS

*700 - The arts/Fine & decorative arts
*710 - Civic & landscape art
*720 - Architecture
730 - Plastic arts/Sculpture
740 - Drawing, decorative and minor arts
750 - Painting & Paintings
*760 - Graphic arts/Prints and Printmaking
*770 - Photography & photographs
*780 - Music
790 - Recreational & performing arts

800 = 899 LITERATURE

800 - Literature (Belles-lettres)
810 - American literature in English
820 - English & Anglo-Saxon literature
830 - Literatures of Germanic language
840 - French literatures
850 - Italian, Romanian literatures
860 - Spanish & Portuguese literatures
870 - Latin literatures
880 - Hellenic literatures/Greek
890 - Literature of other languages

900 = 999 HISTORY

900 - General geography & history
910 - General geography/Travel
920 - General biography & geneology
930 - General history of ancient world
940 - General history of Europe
950 - General history of Asia
*960 - General history of Africa
970 - General history of North America
980 - General history of South America
990 - General history of other areas

*The U of A Library no longer uses these numbers. All of our books for these subjects are now classified in the Library of Congress classification system.

78

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Book # 1 Name _____

ASSIGNMENT ON: CLASSIFICATION SYSTEMS

PURPOSE OF THE ASSIGNMENT:
Libraries use classification systems to bring books on the same subject together in one place. To understand how a classification system works, you must understand the parts of the classification number, or call number.

To answer these questions use the Library of Congress and Dewey Decimal outlines on the preceeding pages.

QH
81 Leopold, Aldo, 1886-1948
L56 A Sand County Alamanac, and sketches here and there; illus. by Charles W. Schwartz. New York,Oxford Univ.

1. What is the call number on the above card?

Answer: _____
_____
_____
_____

2. Is this call number from the Library of Congress or Dewey Decimal classification system?

Answer: _____

910.6
C15 McKnight, Thomas Lee, 1928-
v.16 Feral livestock in Anglo America, by Tom McKnight.

3. What is the call number on the above card?

Answer: _____
_____
_____

4. Is this number from the Library of Congress or Dewey Decimal classification system?

Answer: _____

ASSIGNMENT ONE: CLASSIFICATION SYSTEMS

5. In the Library of Congress classification system, books on the subject plant culture would begin with what two letters?

Answer: _____

6. In the Dewey Decimal classification system, books on the subject mathematics would begin with what three numbers?

Answer: _____

CORRECTION NOTES:

CHAPTER TWO
READING CALL NUMBERS

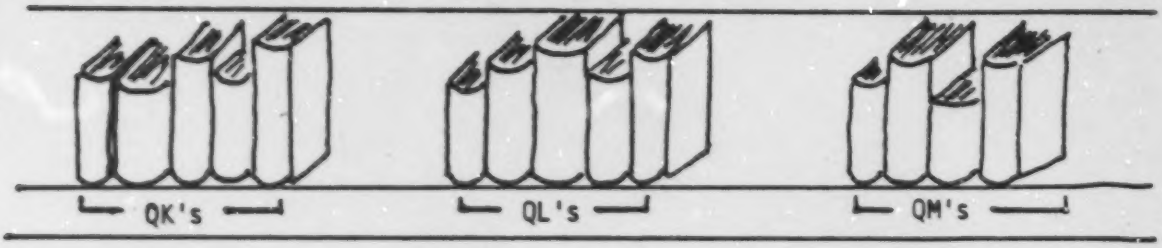
You will need to know how to read call numbers in order to locate books in the library system. The call number determines where a particular book will be placed on the shelf in relation to all other books.

Almost all of the books in the library system are arranged on the bookshelves (often called "bookstacks" or "stacks") by call number. This includes books located in the Main Library "stacks", in the Central Reference Department, and in the branch collections. In order to find the exact shelf location of a particular book, you must be able to read call numbers.

Library of Congress call numbers should be read one line at a time as follows:

A complete call number QL ... Line 1
737 .. Line 2
A77 .. Line 3

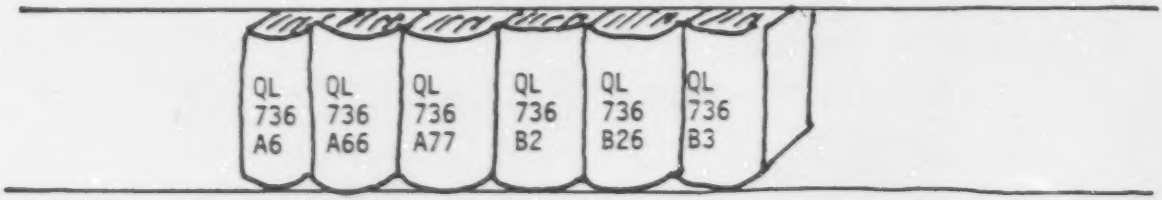
Line 1: Arrangement of Line 1 is alphabetical.



Line 2: Within the QL's, the arrangement of Line 2 is by whole numbers, as in counting.

Line 3: Within the QL 737's, arrangement of Line 3 is first alphabetical and then numerical; however, the number in Line 3 is read as a decimal number rather than a whole number.

Read A7 as A.7; then the order would be:
A7 followed by A77, followed by A8, etc.



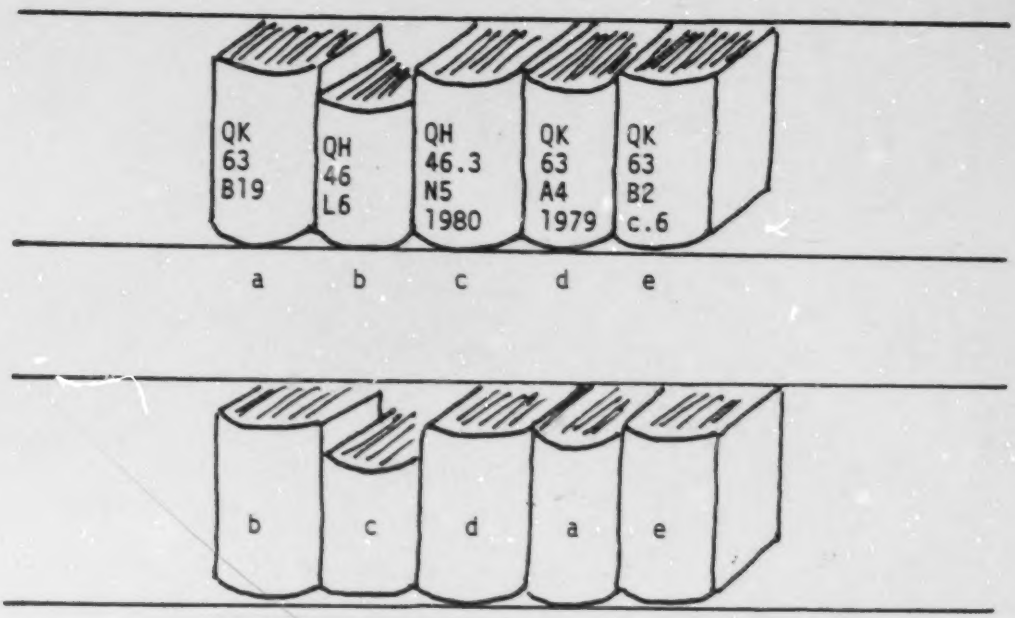
Book # 1 Name _____

ASSIGNMENT TWO
READING CALL NUMBERS

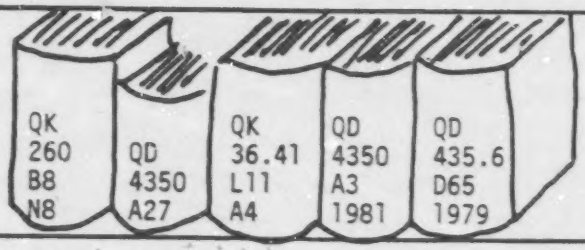
PURPOSE OF THE ASSIGNMENT:
In order to find books on the shelves, you will need to be able to read call numbers. The COMPLETE CALL NUMBER determines the position of the book in relation to all the other books on the shelf.

The following sequences of books have been shelved in the wrong order. For the purpose of this assignment, each book has been labeled with a lower case letter. Indicate the correct order of the call numbers by using the lower case letters, not the actual call numbers.

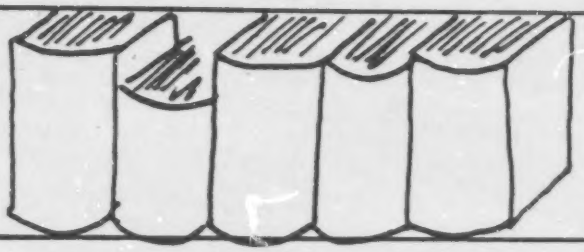
Example:



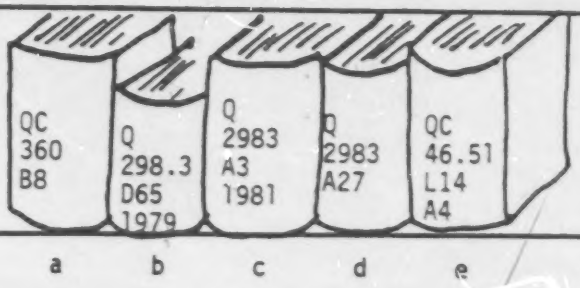
Question 1:



Answer 1:

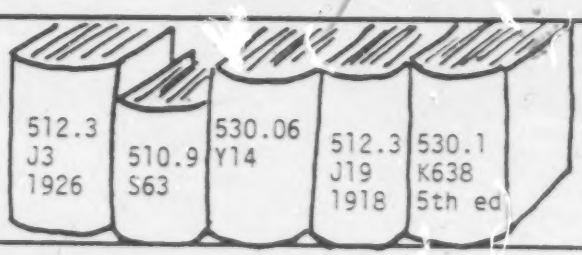


Question 2:



Answer 2:

Question 3:



Answer 3:

CHAPTER THREE
THE AUTHOR/TITLE CARD CATALOG

> The key to identifying books which the library owns is the Card Catalog located in the Science Reference Department. In the card catalog you will find the call numbers needed to locate books. The Science Card Catalog only lists books located in the Science-Engineering Library collection. To locate materials in the Main Library or any or the other branch libraries you will need to use the Main Card Catalog located in the Central Reference Department, Main Library.

The Card Catalog is divided into two sections:

AUTHOR/TITLE - lists books by authors and titles.

SUBJECT - lists the same books by subject.

Part A: Author/Title Card Catalog

The first thing that you will notice about the Author/Title Card Catalog is that it has been divided into two parts called the OLD AUTHOR/TITLE CATALOG and the NEW AUTHOR/TITLE CATALOG. This was done in preparation for the on-line catalog which will be in place in the library in several years. Until then, you may need to look in two author/title catalogs to determine if the library owns a particular book.

OLD AUTHOR/TITLECATALOG: Contains cards for items added to the library before 1984. This includes:

1. Most material that was previously found in the OLD catalog since little has been taken out of the OLD catalog and put into the New one.
2. Most material published before 1980. Remember that it is the date that the item was added to the library's collection, rather than the date it was published, that determines whether its cards are found in the OLD or NEW catalog.

NEW AUTHOR/TITLE CATALOG: Contains cards for items added to the library from 1984 on. This includes:

1. All items published in 1984 or later.
2. All other items, regardless of their publication date, which have been added to the library's collection since January 1, 1984.

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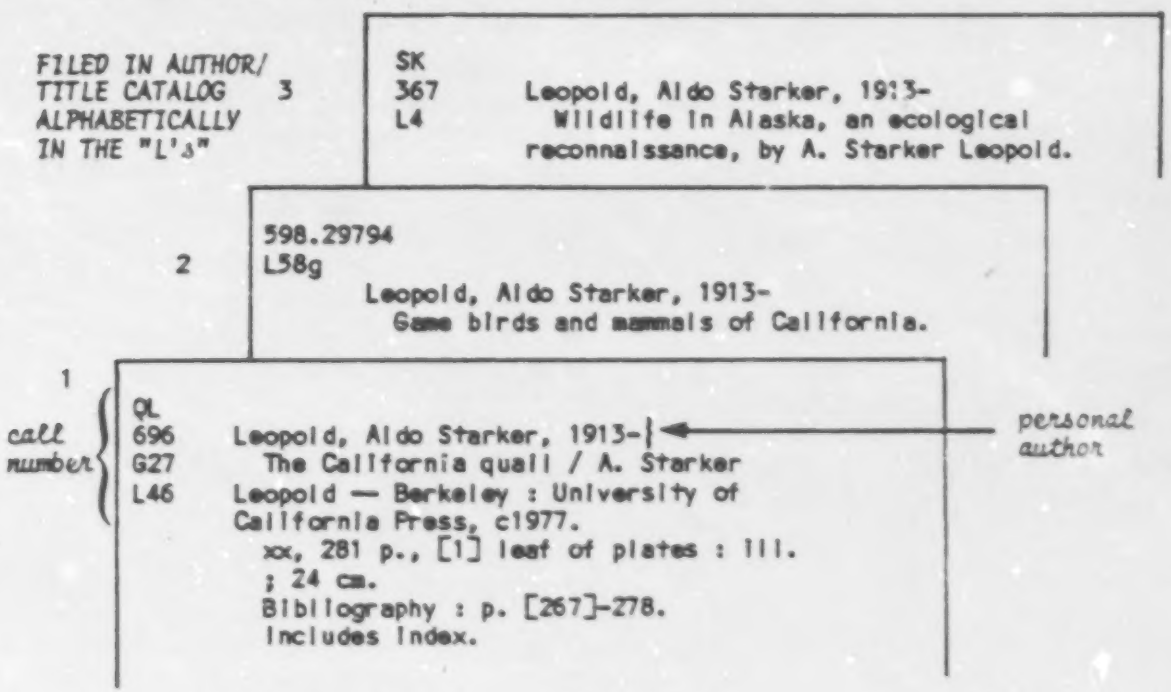
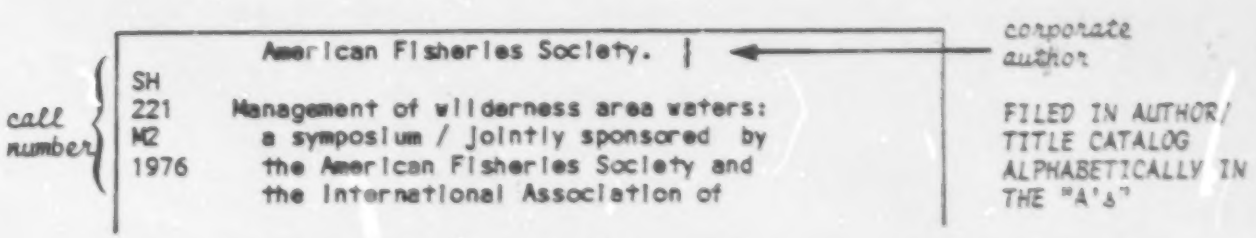
NOTE: Material published in the early 1980's could be in either catalog. Always check both before giving up.

The **AUTHOR** of a book may be either a **personal author**, such as a writer or composer, or a **corporate author**, such as an association, organization, or a government agency. If the author is an individual, such as Aldo Starker Leopold, you can look up his works under his last name, Leopold, in the Author/Title catalog. If the author is a corporate author, such as the American Fisheries Society, you can look up its publications under the first main word of its name, American, in the Author/Title catalog. Following are examples of catalog cards for these two types of authors.

Personal Author Cards:



Corporate Author Card:


call number
SH
221
M2
1976
American Fisheries Society.
Management of wilderness area waters: a symposium / jointly sponsored by the American Fisheries Society and the International Association of
corporate author
FILED IN AUTHOR/ TITLE CATALOG ALPHABETICALLY IN THE "A's"

Once you have found the author's name in the catalog, you will see that the cards for that author's books are arranged alphabetically by title. For example, under **Leopold, Aldo Starker**, you will find that his book entitled Game Birds and Mammals of California is filed directly after his book entitled The California Quail.

You may also look up a book under its title in the Author/Title section of the card catalog. For example, the title The California Quail by Aldo Starker Leopold is filed alphabetically in the C's, along with other books that have "California" as the first word of the title.

Title Cards:

FILED IN AUTHOR/ TITLE CATALOG ALPHABETICALLY IN THE "C's"

3
California ranchos and farms
S
451 Warren, John Quincy Adams.
C2 California ranchos and farms, [illegible]-1862,
W16 including the letters of John Quincy Adams

2
California quake
QE
535.2 Meyer, Larry L., 1933-
U6 California quake / Larry L. Meyer.
M47 Los Angeles : Sherbourne Press, [1977]

1
The California quail
QL
696 Leopold, Aldo Starker, 1913-
G27 The California quail / A. Starker
L46 Leopold. — Berkeley : University of
California Press, c1977.
xx, 281 p., [1] leaf of plates
; 24 cm.
Bibliography: p. [267]-278.
Includes index.

titles

All author and title cards are interfiled in one alphabetical sequence. The filing system is sometimes complicated, so be sure to look carefully. Note that articles such as "a", "an", and "the" and their foreign language equivalents, are disregarded when they appear at the beginning of a book title or corporate author. The Desert Bighorn will be filed alphabetically under "Desert" and Las Aves Argentinas will be filed under "Aves".

Catalog cards contain other information which can be important to you. The publication date will help you to determine if the book will be useful to you. If, for example, you are interested only in current developments on a topic, then you will want to read books published within the last few years.

In order to include a book in the bibliography at the end of your essay, you will need to know the publisher as well as the publication date. The publisher could be a well known publishing company, a small press, or an organization or association. The standard way of indicating the publisher on a catalog card is to list the city of publication, followed by a colon, semicolon or a comma, and then the name of the publisher. The example on the next page shows how to find this information on a catalog card.

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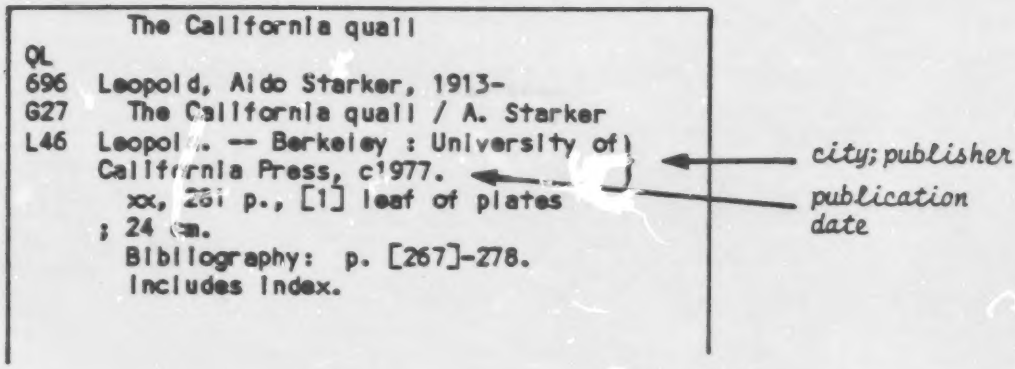
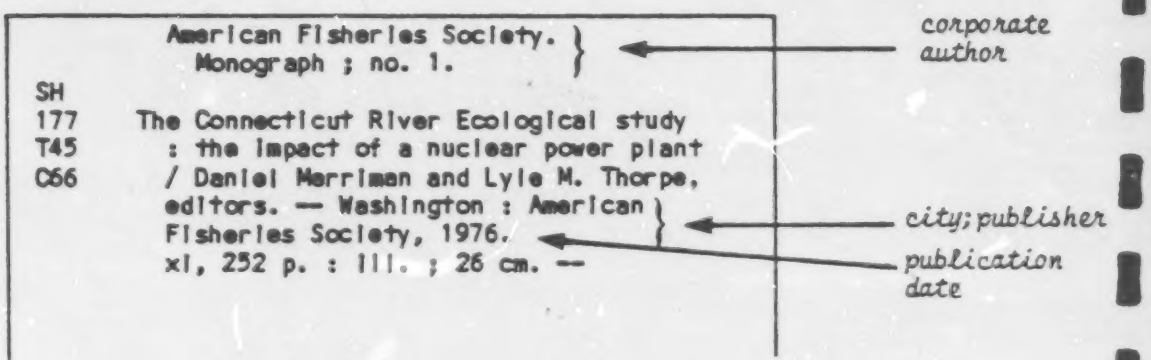
Example:



Sometimes the corporate author of a book will also be the publisher. In this case, the name of the organization which produced the book will appear on the card twice: In the proper space for a corporate author and in the proper space for a publisher. The following example illustrates this.


American Fisheries Society.
Monograph ; no. 1.
corporate author
SH
177 The Connecticut River Ecological study
T45 : the impact of a nuclear power plant
C66 / Daniel Merriman and Lyle M. Thorpe,
editors. -- Washington : American
Fisheries Society, 1976.
xi, 252 p. : ill. ; 26 cm. --
city; publisher
publication date

Book # 1 Name _____

ASSIGNMENT THREE
THE AUTHOR/TITLE CARD CATALOG

PURPOSE OF THE ASSIGNMENT:
There are three ways to look up books in the AUTHOR/TITLE CARD CATALOG: 1) personal author of the book; 2) corporate author or agency responsible for the writing of the book; and 3) title. The catalog card will contain other important information such as the publication date and the name of the publisher.

Use the OLD AUTHOR/TITLE CARD CATALOG in Central Reference to answer the following questions.

Questions 1 and 2: Look up these books by **AUTHOR.**

1. In a bibliography you found that Donald M. Miller wrote a book entitled Amphibians and Reptiles of the Grand Canyon Nat Park.

   a. What is it's call number?

   ANSWER: _____

   b. What is the name of the publisher?

   ANSWER: _____

   c. What is the publication date?

   ANSWER: _____

2. Your instructor mentioned that Derrick Ovington wrote a book entitled Australian endangered species:mammals,birds and reptiles.

   a. What is its call number?

   ANSWER: _____

   b. What is the name of the publisher?

   ANSWER: _____

   c. What is the publication date?

   ANSWER: _____

ASSIGNMENT CONTINUED ON THE NEXT PAGE!

ASSIGNMENT THREE
THE AUTHOR/TITLE CARD CATALOG

Questions 3 and 4: Look up these books by TITLE.

3. Your classmate recommended a book entitled Disappearing species: the social challenge. He/she thinks it was written by Erik P. Eckholm.

   a. What is the call number for this book?

   ANSWER: _____

   b. What is the name of the publisher?

   ANSWER: _____

   c. What is the publication date?

   ANSWER: _____

4. An index to Montana wildlife literature, 1950-1976 is a book by Larry S. Thompson.

   a. What is the call number for this book?

   ANSWER: _____

   b. What is the name of the publisher?

   ANSWER: _____

   c. What is the publication date?

   ANSWER: _____

CORRECTION NOTES:

CHAPTER FOUR
THE SUBJECT CARD CATALOG

If you need to find books on a particular subject, and you have no specific author or title, you will want to use the **SUBJECT CARD CATALOG.** The subject section of the card catalog lists the books which the library owns according to subject content. Every non-fiction book in the library is listed under one or more subject headings and a card with the appropriate heading is filed in the Subject Card Catalog.

Subject Headings - How to Determine Which Heading to Use

SUBJECT HEADINGS are index terms which describe the major theme or content of a book. Often you can look directly in the subject card catalog under the terms commonly used for your topic and find exactly what you are looking for. Sometimes, however, the subject terms used in the catalog will differ from the terms which you have in mind. The headings used in the subject card catalog are part of a controlled vocabulary which eliminates the need for you to look under synonymous terms.

In order to determine the appropriate subject headings used for your topic, you should consult the Library of Congress Subject Headings. This two volume red set is a list of the terms or headings used in the Subject Catalog. It has two important functions:

1. It will provide you with the proper term used for your topic.
2. It will often suggest other related headings that you can [illegible] in the subject card catalog.

Suppose you are looking for information on fish stocks and this is the first phrase that comes to your mind as a subject heading. Let's examine a section from a page in the Library of Congress Subject Headings. Looking at these sample headings below, you note that your phrase, "Fish stocks" is listed with a "See" reference. This indicates that the term you have in mind is **not** used in our subject card catalog and the "See" refers you to the heading that **is** used, "Fish populations". A "See" reference will tell you what subject heading is the correct one to use.

"See" reference - Fish populations is the subject heading for this topic.

Fish stocks
See Fish populations
Fish tagging *(Indirect)* *(SH156.8)*
x Fish marking

On the other hand, if the term you have in mind **is** a subject heading, it will be printed in boldface black type. If you had looked up "Fish populations" first, you would find that this is the subject heading used in the card catalog.

As you examine the sample list of subject headings on the next page, note that under the subject heading "Fish populations" additional related and more specific subject headings are suggested. The symbol "sa" means "see also" and the related subject heading suggested is "Fishes - Racial analysis".

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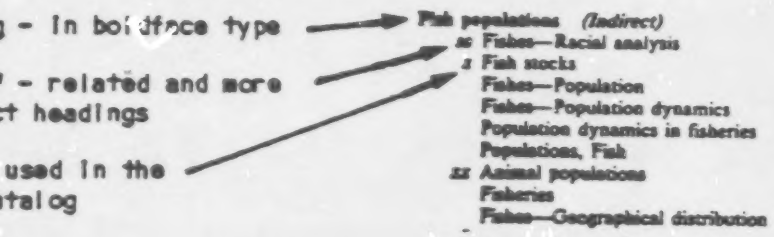
Other symbols used in the Library of Congress Subject Headings are: "xx" which indicates related but more general subject headings, such as "Animal populations", and "x" which designates a term not used in the card catalog, such as "Fish stocks".


Subject Heading - in boldface type
sa - "See also" - related and more specific subject headings
x - a term not used in the subject card catalog
Fish populations (Indirect)
sa Fishes—Racial analysis
x Fish stocks
Fishes—Population
Fishes—Population dynamics
Population dynamics in fisheries
Populations, Fish
xx Animal populations
Fisheries
Fishes—Geographical distribution

Using the Subject Headings

When you have identified the subject headings relevant to your topic in the Subject Headings book, you can then look up those headings in the Subject Card Catalog. When looking up "Fish populations" you will find several books filed under this topic. On each subject card, the subject heading will appear in capital letters at the top of the card just above the author's name. Below is the subject card for D. H. Cushing's book entitled Fisheries Biology: A Study in Population Dynamics.

FISH POPULATIONS
QL
618.3 Cushing, D. H.
C86 Fisheries biology : a study
1981 in population dynamics / D. H.
Cushing — 2nd ed. -- Madison,
University of Wisconsin Press, 1981

Subject cards are arranged in the card catalog alphabetically by subject headings, and under each subject heading, alphabetically by author's name. In the following example of a set of subject cards on FISH POPULATIONS note that the third book has no personal author so it is filed alphabetically by title.

3
FISH POPULATIONS
SH
327.5 Fish population dynamics /
F57 edited by J. A. Gulland

2
FISH POPULATIONS
SH
328 Everhart, W. Harry (Watson, Harry) 1918-
R69 Principles of fishery science / W. Harry
1981 Everhart, William D. Youngs -- 2nd ed. --

1
FISH POPULATIONS
QL
618.3 Cushing, D. H.
C86 Fisheries biology: a study
1981 in population dynamics / D. H.

Persons as Subjects

Let's backtrack a bit. Remember that in order to find books by an author, you looked up his or her last name in the author/title catalog and identified the books that he or she wrote which the library owns. However, at other times, you may not be looking for books by a person, but may need to find books about that person. In this case, you would look in the subject card catalog under the person's last name. For example, books written by Aldo Leopold are listed in the author/title catalog under Leopold, Aldo. Books about him and his work are listed under the subject heading LEOPOLD, ALDO, 1886-1948 in the subject card catalog. Subdivisions may also appear after individuals' names in the catalog. Names of persons do not appear in the Library of Congress Subject Headings book because it would be impossible to print such an exhaustive list.

Leopold as an AUTHOR

Author card filed under "L" in the author/title catalog

SK
361
L38 Leopold, Aldo, 1886-1948
Game management, by Aldo Leopold . . . drawings by Allan Brooks. New York, London, G. Scribner & Sons, 1933.

Leopold as a SUBJECT

Subject card filed under "L" in the subject card catalog

LEOPOLD, ALDO, 1886-1948

QH
31
L618 Flader, Susan L.
Thinking like a mountain: Aldo Leopold and the evolution of an ecological attitude towards deer, wolves, and forests [by] Susan L. Flader. Columbia: University of Missouri Press, 1974.

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Subject Subdivisions

Books about fish populations in general will be listed directly under the heading FISH POPULATIONS. Once you have gone through these cards, the next group of cards will indicate books on specific aspects of fish populations for example, FISH POPULATIONS — MATHEMATICAL MODELS. "Mathematical models" in this case is a **SUBDIVISION** of your major heading. It indicates that this book is not on fish populations in general, but on the use of mathematical models with fish populations. This subdivision is illustrated on the following subject card.

FISH POPULATIONS — MATHEMATICAL MODELS
QH
541.5 Beyer, Jan E.
W3 Aquatic ecosystems: an operational
B48 research approach / Jan E. Beyer —
1981 Seattle: University of Washington Press,
c 1981.
lx, 315 p.: ill. ; 22 cm.
Revision of the author's thesis (doctoral
— Technical University of Denmark, 1976)
Bibliography: p. 301-315.

In the subject card catalog, subdivisions are filed alphabetically after the main heading. Other subdivisions under FISH POPULATIONS include the following:

5 FISH POPULATIONS — TEXAS
4 FISH POPULATIONS — STATISTICAL METHODS
3 FISH POPULATIONS — ECUADOR
2 FISH POPULATIONS — CONGRESSES
1 FISH POPULATIONS — BRITISH COLUMBIA

To Sum Up

Books in the library may be identified by using one of these approaches:

1. AUTHOR approach in both author/title card catalogs,
2. TITLE approach in both author/title card catalogs, and
3. SUBJECT approach in the subject card catalog.

Examine the three cards below and note that they are identical except for the top line of each card.

AUTHOR CARD

Filed in the author/title catalog under the author's last name

```
QL
639.1  Weatherley, A. H.
W4       Growth and ecology of fish
1972   populations [by] A. H. Weatherley.
       London, New York, Academic Press,
       1972.

       x, 293 p. illus. 24 cm.
       Bibliography: p. 263-279.
```

TITLE CARD

Filed in the author/title catalog, under the title of the book

```
       Growth and ecology of fish populations
QL
639.1  Weatherley, A. H.
W4       Growth and ecology of fish
1972   populations [by] A. H. Weatherley.
       London, New York, Academic Press,
       1972.

       x, 293 p. illus. 24 cm.
       Bibliography: p. 263-279.
```

SUBJECT CARD

Filed in the subject catalog under the subject heading FISH POPULATIONS

```
              FISH POPULATIONS
QL
639.1  Weatherley, A. H.
W4       Growth and ecology of fish
1972   populations [by] A. H. Weatherley.
       London, New York, Academic Press,
       1972.

       x, 293 p. illus. 24 cm.
       Bibliography: p. 263-279.
```

Geac

Once you have used the card catalogs to find books on your topic, you can use the **Geac Online Circulation System** to determine whether or not the books you want are checked out. Geac terminals are located at the entrance to the Central Refe rence Department and near the reference desks. The Geac System is "menu driven", which means that the video screen will give you instructions for every step in the search, similar to the way an automatic teller machine at a bank gives instructions.

Geac can be searched by entering an author, a title, or a call number. You cannot look up a subject in Geac the way you can in the Subject Card Catalog. The most efficient way to query Geac is by entering the call number for the book you want. (You should have copied the call number from the catalog card.) Because of the way items are added to the Geac system, you could conceivably search the system using an author or a title and not find the book you are looking for even though it is owned by the library.

Geac can also be used to determine the location of maps, media, and other types of library materials, and to find out whether or not a particular item has been checked out.

In order to determine whether or not an item has been checked out you will need to look sequentially at five different "screens" or "displays". The fifth screen will show the status of the item. Below is an example of the fifth screen for a particular item:

EXAMPLE:

```
 42 GEAC LIBRARY SYSTEM 08-11-84 9:16 Function: Show Catalog entry
CALL # : GL 737-U53 B47 1981
AUTHOR : Berger, Joel.

TITLE:   Social development and reproductive strategies in bighorn sheep/

Cpy   Barcode     Location    Type     Status          Call number
 1    0127033131  Upf/A/sci   book     Due 11-14-85    GL737-U53 B47 1981

Choose from this list, enter here: 8          Then press 'SEND'
M- see bibliographic details                L- see long text for category
C- see what copies are in the library       H- place a hold on this book
F- browse Forwards in the index             B- browse Backwards
E- get a new Search Type for a book         S- get a new call # for browse
X- go back to Main Selection menu
```

Remember that the main function of the Geac system is to determine whether or not items have been checked out. It cannot be trusted in the same manner as the card catalog to determine whether or not the library owns a particular item.

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ASSIGNMENT FOUR
THE SUBJECT CARD CATALOG

PURPOSE OF THE ASSIGNMENT:

You should use the SUBJECT CARD CATALOG when looking for books about a certain subject. The Library of Congress Subject Headings books will help you decide what subject terms to look up in the card catalog.

Books about persons will also be listed in the Subject Card Catalog. The subject heading in the card catalog will be the person's name, although these names will not be listed in the Library of Congress Subject Headings books.

SUBJECT HEADINGS

Questions 1 and 2: To answer these questions use the Library of Congress Subject Headings, the two-volume set of red books on the stands next to the Subject Card Catalog in the Science Reference Department.

1. You have to do a research paper on Protection of wildlife. What is the subject heading for this topic used in the Subject Card Catalog according to the "see reference" in the Library of Congress Subject Headings books?

   ANSWER: _____

2. You have a short paper to do for another course and would like to do something on a specific aspect of forest policy.

   Using the "sa" (see also) reference, what other subject heading might also be helpful in looking up material? (Give only the first heading.)

   ANSWER: _____

ASSIGNMENT CONTINUED ON THE NEXT PAGE!

ASSIGNMENT FOUR
THE SUBJECT CARD CATALOG

THE SUBJECT CARD CATALOG

Questions 3 and 4: To answer these questions use the SUBJECT CARD CATALOG to see if the library has books on your topic.

3a. Look up forest policy. What is the author and call number of the first book under this subject heading?

ANSWER: Author:_____

Call number:_____

3b. Cards found under the heading forest policy identify general books on this topic. This topic may also be subdivided. Look through these cards to see if there are any subdivisions. What is the first subdivision under this topic?

ANSWER:_____

CORRECTION NOTES:

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UNIT I

INTRODUCTION AND OVERVIEW
PUBLICATION SEQUENCE
POPULAR/SCHOLARLY ARTICLES

OVERVIEW

(Introduction of grant team members)

Now I'd like to introduce you to the units we will be presenting, explain the goals and objectives of the units, and introduce you to the Science-Engineering Library (SEL). Today we will go over the importance of library research, the workbook assignment, and the content of the Library Research Study Units. We will also talk about publication sequence and how it will help you to distinguish between popular and scholarly articles, and we will have a tour of the Science-Engineering Library.

IMPORTANCE OF EFFECTIVE LIBRARY RESEARCH

Let me begin with a quote from your testbook. "Wildlife management requires application of an abundance and diversity of information. Principles of wildlife management include concepts shared with several sciences and other professions."*

You may find as a student and as a professional that you must become familiar with the literature--or the information--of for example forestry, ecology, soil science and meteorology. Professional educators in the field have stated the need for wildlife managers to gain information in fields not traditionally in the purview of fish and wildlife managers such as sociology, psychology, and economics. Developing skills which will allow you to find information in a variety of fields and disciplines is essential.

---

*Bailey, James A. Principles of Wildlife Management, New York: John Wiley & Sons, 1984.

Wildlife managers participate in conservation efforts, a process including professionals as well as lay people. You may need to supply information on an issue to agencies, community groups, political groups, private factions--the groups that will influence the final course of an action--for example an environmental law or a resource policy. There is a need to broaden public awareness and interest in wildlife values.

Another important need for effective research relates to your role as a problem solver and decision maker. You will need to get the results of wildlife research which help serve as a basis for management and administrative decision making. Your book points out that wildlife principles change. They are neither unchallengeable nor unchanging. What may be widely accepted today may become expanded, modified, or discarded and replaced, as new knowledge provides new insight.

Decisions demanded by management and land use situations should be made with a thorough knowledge of the most recent research available. In fact in your Final Assignment in the Library Research Study Unit you will simulate a management situation, with you as the problem solver. You will be asked to gather and synthesize information important to biologists and managers. You will be gathering information on one species and a life history trait (such as Arizona trout--disease, white-tailed deer--distribution) and summarizing relatively recent findings. You will be asked to offer management recommendations, identify future research needs, or forecast future conditions or needs. A copy of the Final Assignment is included in your packet. We will be saying more about it later--but you may want to look at it to see where the units are leading.

For those motivated by the practical, this is not the only course in your curriculum requiring papers and library research. Silviculture, For-

est Resource Management, Range Planning and Economics, and Recreation Resource Planning all have research components.

ANY QUESTIONS?

WORKBOOK ON BASIC SKILLS

We have developed several exercises designed to review basic library skills and concepts. This is to ensure that you have the basic research skills upon which the rest of the units can build.

You may find the experience easy. If so, that is great. But for those who have had less research experience it provides an opportunity to gain the background you need or serves as a good refresher.

The exercises are included in four chapters:

-Classification Systems

-Reading Call Numbers

-Author/Title Card Catalog

-Subject Card Catalog.

Each chapter contains narrative (or text) pages. They give you the information you need to complete the assignments. Read these pages first, before you try to complete the assignment pages. The questions you answer are individualized--25 sets of questions--so you do not have to go to the same sources.

ANY QUESTIONS?

DESCRIPTION OF UNITS

Today we will discuss Publication Sequence and Popular/Scholarly Literature. On October 12th we will cover Indexes. We will answer the questions: What is an index? When and how do you use indexes? We will discuss the differences between one and two step indexes (index and abstracts). We will present guidelines for narrowing down a topic using indexes and dis-

cuss using indexes to develop key words which lead you to further information on your topic (finding related information on a topic).

On October 19th an introduction to Government Documents will be given. We will attempt to demystify them. For many people the Government Documents Department seems to be an unapproachable place because of people's perception of what a document is. Just the term "document" can sound intimidating to some--very official. We will answer the questions: What is a document? Why are they important? How do we, the library, acquire them? Where are they housed? How do you find documents in the library? How do you use the document's card catalog? How do you use the Monthly Catalog (a basic source for finding federal documents)?

On October 26th we will discuss the final unit, Known Item Searching. This is the term used when you have a reference or citation "in hand." It may be a reference to a book, a journal article, a thesis, a government document, etc. You may have found it through a footnote in an article, through an index, or even the card catalog. You have some reason to believe that it exists somewhere. We will cover the following topics: interpreting parts of a citation; unraveling abbreviations; the nature of serials problems--journals, magazines--common errors in citations. How do you find journals in the Science-Engineering Library? How do you find theses? How do you find conference reports? For your final assignment you will have the opportunity to put all of the skills you acquired and expertise together and apply it toward a research project.

ARE THERE ANY QUESTIONS?

PUBLICATION SEQUENCE

Publication sequence is the order in which information appears in published format. We will take it from the research idea . . . to the

journal article . . . to the point when perhaps such ideas or principles are integrated into the knowledge of the field. An understanding of publication sequence will assist you in understanding how information in a particular field is organized, how people in that field communicate with each other, the difference between primary and secondary sources, and the distinction between popular and scholarly sources. This is a distinction we will emphasize because in your role as wildlife managers you must be able to differentiate between an article directed toward tha popular audience and one directed toward a scholarly or professional community.

I'd like to go through two of the Publication Sequence models--Tracing an Idea--Journal Articles, and Popular Literature. (See handouts.) I want to point out that this is what we call in library jargon a conceptual framework or organizing principle. What this means is that for most people libraries are complex places, and the reasons for how information is organized, stored, and retrieved can be rather confusing or senseless to the uninitiated. Publication sequence provides a framework upon which we will attempt to bring together what may have previously appeared to be unrelated or meaningless facts so they will have an order and be given meaning.

It may seem a little theoretical now, but it will seem less so as these units progress. It is a framework to which you may want to refer back to during the course of these units.

ANY QUESTIONS?

TRACING AN IDEA--JOURNAL ARTICLES (See handout)

1. Ideas--Sources for Research. Where do research ideas come from? There is no one answer. Ideas may come from informal conversations with colleagues. You may have a professor who has attended a conference or meeting and heard a paper presented which sparked an idea in him that warrented further investigation.

2. Research and Investigation. Here the researcher may request informal comment and evaluation from colleagues or may send a copy of his work-in-progress to a subject expert familiar with this type of research.

3. Reports to Small Groups. Here the information may be in the form of an interim or progress report. It may go to a sponsoring agency--the organization which perhaps funded the research. It could be reported at a departmental meeting within the researcher's own institution. (This is all part of the informal information network. This information exchange is going on, but the information is not available in most library collections.)

4. Local, State, or National Conferences. Here a paper may be presented on the subject. There may be a call for papers, and if perhaps your professor is doing work within the guidelines of the conference theme or if she is an established researcher doing serious study of a topic she might be asked to contribute. This introduces the ideas to the larger scientific community. On the other hand, the person doing the research, the speaker, or author may find out of other related work being done--perhaps similar work or work which would be relevant to her study.

5. Journal Article Accepted. Once a journal article is accepted, what we call preprints are available. This is the manuscript. You must keep in mind that often there is a significant time lag between the time the information/article is accepted and it makes its way into print (six months to a year).

6. Journal Article Published/Conference Proceedings Published. The sixth step is when the journal article is published. This is the point at which it comes into the formal information network. Here it is available in libraries and to subscribers.

7. Journal Article Indexed. However, not until a journal article is indexed does it become more readily available. Individuals familiar with a particular subject or author can now easily gain access to the work. (The next session will explain indexes in depth.)

8. Journal Article Cited By Others. Once a journal article has been read and analyzed, it may appear in the footnotes or bibliography of other researchers. Your professor's article, ideas, conclusions, or projections on an issue or concept may have been read by another researcher and examined or referred to in her own paper and documented in the bibliography, reference, or literature cited sections. Or, you may read an article and form ideas, conclusions, and projections on an issue or concept based on your reading and refer to the article in your own paper and document it in the bibliography, references, or literature cited sections.

9. Key Articles Emerge. Eventually the information on a subject may be brought together in the form of a review of the research which brings together current thinking and research on a particular topic such as a state of the arts report, as well as putting current thinking into its historical context by providing background information on the topic.

10. Integration into Knowledge of Field. Finally you may find that certain ideas, concepts or principles become accepted by the authorities in the field and are integrated into the established knowledge (e.g. textbooks).

11. Available in Reference Sources. Access to such information is available through reference sources such as handbooks (included in) and encyclopedias (summarized in). ARE THERE ANY QUESTIONS?

POPULAR LITERATURE (See handout)

As I said earlier this is a convenient model for explaining several concepts. Let's look at the Popular Literature model. Here we see that information may sidestep the normal publication sequence. It may appear in print--books, press releases, newspaper articles, or magazine articles--from any point in the publication sequence. It does not have the benefit of the scientific community's response or evaluation. It has not been modified or refined. Conclusions can be reported prematurely. It may not be presented by an authority. It may have been popularized and simplified (difference in language use and vocabulary). It may not be interpreted accurately or reported accurately. It may be emotional with the issues highly dramatized. It is important that you be able to distinguish an article written for a popular audience and one intended for the scholarly community.

Riedman, Marianne L. and Le Boeuf, Burney J. "Mother-Pup Separation and Adoption in Northern Elephant Seals" Behavioral Ecology and Sociobiology (1982) 11:203-215.

Greenberg, Joel "Sex, Violence and Plenty of Rest" Science News vol. 125: 120-123. February 25, 1984.

The above articles point out by example the differences between a popular and a scholarly treatment of similar topics. The objective of the article "Mother-Pup Separation and Adoption in Northern Elephant Seals" is to examine the reproductive consequences of raising young, under crowded, low density breeding conditions. The title and tone of "Sex, Violence and Plenty of Rest" leave little doubt that it is anything but popular. It is an overview of the factors which have influenced successful breeding of the Northern Elephant Seal which was extinct 100 years ago.

There are several ways of identifying the scientific article. Generally it reports the results of investigation, includes methodology, reports

data collection, makes reference to earlier studies, and is written by a subject expert. The popular article is written for the nonscientist--the nonexpert. It is designed to be more easily understood by a general audience and is generally descriptive in nature.

Let's look at the journal in which the scholarly article appears. Behavioral Ecology and Sociobiology states clearly that it accepts only original contributions dealing with quantitative analysis and experimental analysis. Science News, on the other hand, publishes articles by professional journalists who rewrite the work of scientists. It is kind of a scientific Reader's Digest.

Look at the author's credentials. Joel Greenberg is a journalist. The authors of "Mother-Pup Separation and Adoption" are affiliated with a recognized research institution--Center for Marine Studies, University of California Santa Cruz.

There is a difference between how background information is presented. Greenberg's article states "For more that a decade scientists from UCSC and elsewhere have studied and recorded the behavior of these mammals." Riedman and Le Boeuf tell us that "Adoption and fostering behavior have been reported previously in Northern Elephant Seal breeding rookeries" and give a long list of references to other published reports.

The article "Mother-Pup Separation and Adoption" clearly states research methodology used. It describes the study area, identifies methods used for marking and identifying the pups and females, and identifies methods used for recording the behavioral observations. The results are reported as well as the conclusions drawn from the results. In contrast, Greenberg's article is a purely descriptive rewriting of other's findings.

The assignment following the unit on indexes and abstracts will give you practice in distinguishing between popular and scholarly/ scientific articles. Please read th two articles indluded in your binder, and complete the Workbook on Basic Skills for next week.

(Following the presentation there is a tour of the reference section of the Science-Engineering Library.)

TRACING AN IDEA--JOURNAL ARTICLES

1. Sources for research ideas

   (Colleagues, journals, conferences, informal information network, "Hotel Bar")

2. Research and investigation

   (Informal comment, review by subject experts familiar with this research)

3. Reports to small groups

   (Interim reports, progress reports to sponsoring agency or own institution)

4. Local, State and National conferences

   (Papers presented to the larger scientific community resulting in requests for paper, author may learn of related work in the field)

5. Journal article accepted

   (Pre-prints available)

6. Journal article published/conference proceedings published

   (Published article available, conference proceedings available)

7. Journal article indexed

   (Indexing and abstracting services, secondary sources)

8. Journal article cited by others

   (bibliographies, citation sources)

9. Key articles emerge

   (Review of research)

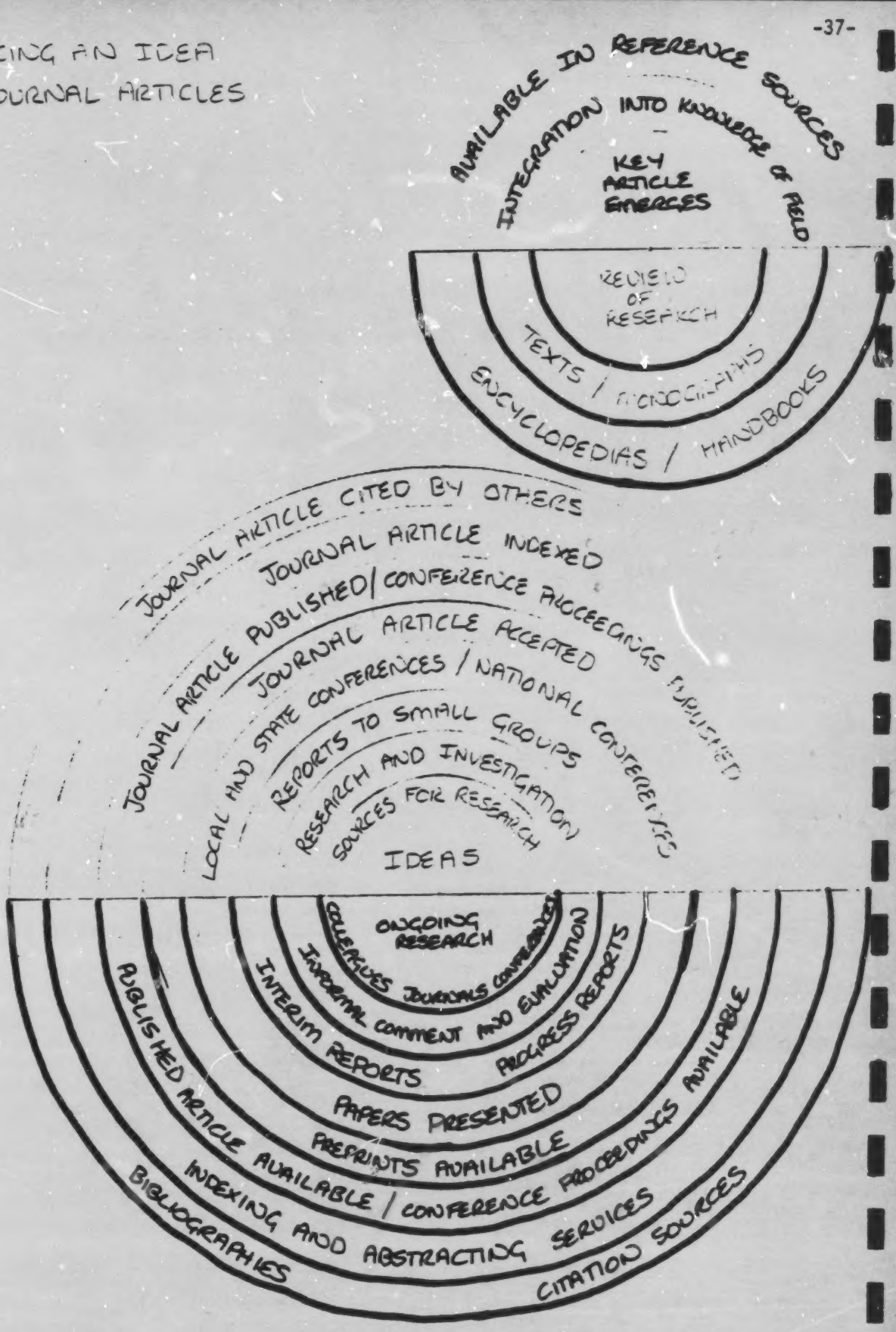
10. Integration into knowledge of field

    (textbooks, monographs)

11. Available in reference sources

    (encyclopedias/handbooks)

TRACING AN IDEA
JOURNAL ARTICLES



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TRACING AN IDEA--BOOKS

1. Sources for research ideas

   (Colleagues, journals, conferences, informal information network, "Hotel Bar")

2. Research and investigation

   (Informal comment, review by subject experts familiar with this research)

3. Reports to small groups

   (Interim reports, progress reports to sonsoring agency or own institution)

4. Local, State and National conferences

   (Papers presented to the larger scientific community resulting in requests for paper, author may learn of related work in the field)

5. Book accepted

   (Pre-prints available)

6. Book Published

   (Book available)

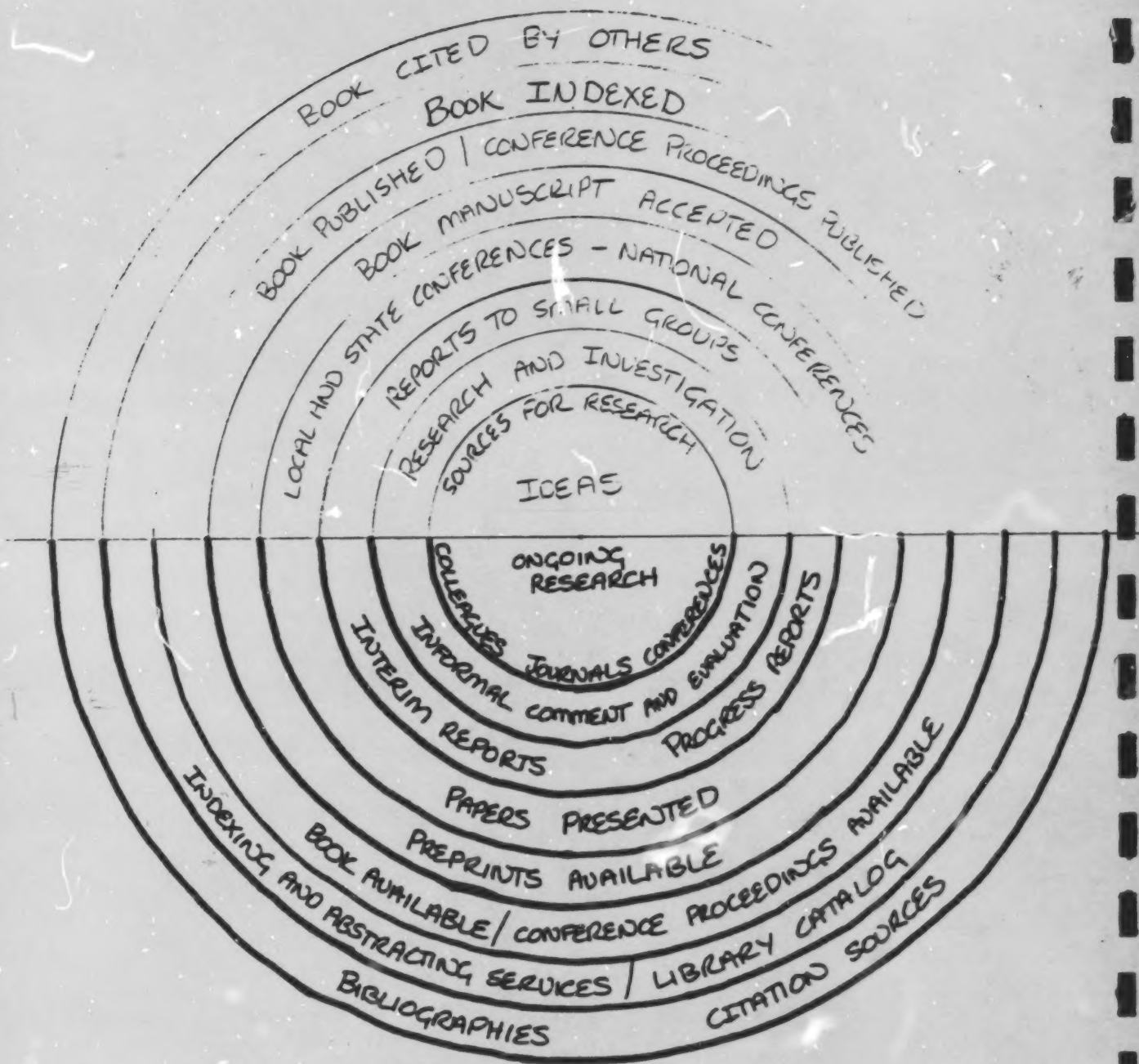
7. Book indexed

   (Indexing and abstracting service, Library catalog)

8. Book cited by others

   (bibliographies, citation sources)

TRACING AN IDEA
BOOKS



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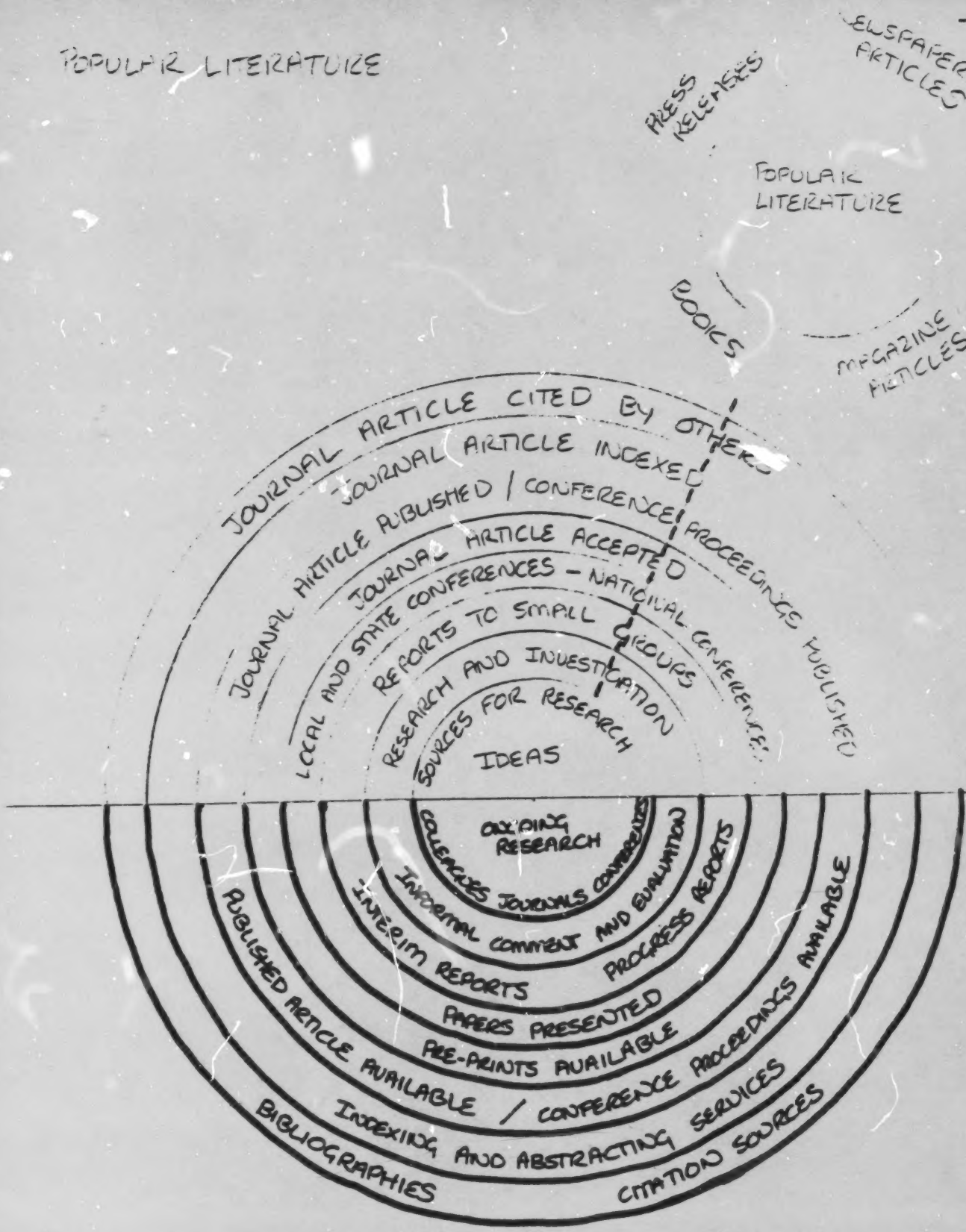
TRACING AN IDEA--POPULAR LITERATURE

Popular Literature: Books, press releases, newspaper articles, magazine articles.

This information may sidestep the publication sequence. It may jump into print from any point in the sequence. Such information has not had the benefit of the scientific community's response and evaluation. It has not been modified or refined. It may not be presented by an authority.



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UNIT II

INDEXES AND ABSTRACTS

One of the key sources of information for students and researchers in fisheries and wildlife is the journal literature. In the previous session, we discussed "publication sequence"--the sequence that an idea, theory, or discovery generally follows as it becomes a part of published knowledge. As you remember, the journal article is one of the first places that information shows up in a format available to more than just a few people. Today, the main topic of discussion will be what kind of control there is over the increasing volume of journal articles. To bring it down to the practical level--how do you, the student, find articles on the topics you may choose to research?

The informal network of classmates and professors can sometimes serve as a beginning. Dr. "X," for example, may tell you of a few key articles on Gila trout. Your classmate may have recently read an article on the distribution of the black bear in Arizona. Nevertheless, for a comprehensive, objective review of the literature the "informal network" will not be totally adequat Periodical indexes and abstracts are what I would like to introduce as the means of finding the journal articles that you will need as sources of information in your research and study.

DEFINITION OF TERMS

Before we get too much further, let me define what I am talking about when I use the terms "index" and/or "abstract." An index is a listing of papers (i.e. journal articles, conference papers, etc.), usually arranged by subject and author--often by other ways as well, such as taxonomic classification, geographic area, etc. Most indexes come out in monthly or sometimes even bimonthly issues, and are cumulated annually. This ensures that the papers listed will be fairly recent. (Usually there is a lag time of about

2 to 6 months from the time a journal article appears in print and the time it shows up listed in the indexes.*) The information given for each paper includes the following (not necessarily in this order): author of the paper, title of the paper, title of the journal (or source document, if it is not a journal), volume and issue number of the journal, inclusive page numbers of the paper, and the date. This unit of information is called a bibliographic citation or reference. It contains the basic information necessary to locate an article or paper. Examples of indexes (which we will talk about in more detail later) are Biological and Agricultural Index, Wildlife Review, and Zoological Record.

To define an "abstract", let me first say that to be precise I should probably be saying "abstracting journal." An abstract is a short summary of an article or paper. An organized listing of these abstracts with the bibliographic citation included for each article, is an "abstracting journal." An abstracting journal is essentially the same thing as an index. It is arranged by subject or author, with subject, author, taxonomic, or geographic indexes providing access to each abstract. It is published on a frequent and regular basis. The main difference, as you have probably already deduced, is the inclusion of an abstract (short summary) of each paper. Examples of abstracting journals are Biological Abstracts, Aquatic Sciences and Fisheries Abstracts, etc.

At this point, let me clarify something that I have already hinted at.

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*This average is based on statistics from the following articles:

Poyer, Robert K. "Time lag in four indexing services" Special Libraries 73 (2): 142-146. April 1982.

Miller, Betty and Rau, Susan L. "Investigation of the index lag of Engineering Index and Electrical and Electronics Abstracts." Information management in the 1980s: proceedings of the 40th ASIS Annual Meeting, Chicago, IL, Sept. 26-Oct. 1, 1977. v. 14, pt. 2, fiche 6, frame A8- .

Indexes and abstracts primarily pick up journal articles. You may, however, find references to other types of publications such as conference papers, dissertations, government documents, technical reports . . . sometimes even chapters from books. For each of these different types of publications there is a slightly different format for the citation and a slightly different way of finding out if the UA Library owns it. In another session ("Known Item Searching") we will spend more time discussing these differences. Today I will limit myself to discussion of the journal literature.

Before we talk about specific indexes, let's discuss briefly the reasons and advantages of using indexes and abstracts. We've already mentioned that indexes and abstracts provide an objective, methodical way of compiling a list of references on a certain topic. It frees the researcher from having to depend upon word of mouth or his own perusal of all the possible relevant journals. It is true that in some cases a researcher in a highly specialized field might only have 2 or 3 key journals to scan in order to stay abreast of developments in his or her field. However, science is becoming increasingly interdisciplinary and the amount of information is continuing to expand. No one has the time to browse through all the journals that might be relevant to a particular subject. Indexes and abstracts provide a more effective method of finding relevant articles.

Abstracts have several real advantages. 1. No one library, not even ours, can own all the journals that are published or have been published. Having at least an abstract can provide some information on what kind of research is being done, what methods are being used, etc. This is useful not only in the case of journals which we do not own, but also (and especially) in the case of journals which are in foreign languages which you may not understand. An abstract of an article can give you some basis on which to

decide whether to request a photocopy through Interlibrary Loan (if it is from a journal we do not own) and/or whether to try to obtain a translation of a foreign language article. 2. Even if our library does own the journal, reading an abstract can help you decide whether it is worth it to actually go to the shelf to get the full article. In other words, if the abstract indicates that the article is not really what you thought it was going to be, you can ston your search at that point and start looking for a more appropriate article. 3. Finally, scanning the indexes and abstracts is often a good way to get ideas for topics to do papers on. When you have a general interest in doing a paper--say, on some aspect of fisheries, but you are having trouble narrowing the subject down any further, it could be helpful just to scan the subject headings and/or the titles of papers in something like Aquatic Sciences and Fisheries Abstracts or Current References in Fish Research--two relevant indexes. This can give you ideas and hopefully peak your interest in a more specific aspect of fisheries. It is important to have a clearly delineated topic when you begin to do your research.

ARE THERE ANY QUESTIONS SO FAR?

DOWN TO SPECIFICS

Okay, we've talked about indexes and abstracts in general terms. Let's get down to specifics. On the handout titled "Wildlife and Fisheries Indexes and Abstracts" you will find listed some indexes and abstracts relevant to both the biological aspects of fisheries and wildlife and the social science (i.e. economic, psychological, political, etc.) aspects of fisheries and wildlife. In addition, we have listed a few indexes which pick up the "popular" magazine article. You can see that there is a real variety of indexes available--from the very broad coverage (Public Affairs Information Service Bulletin, for example, is an index to papers relating to "economic

and social conditions, public administration, and international relations.)--to the much more narrow coverage (Sport Fishery Abstracts). Let's look at a few of the biological/life science related indexes and abstracts and see how they work. We will use Biological and Agricultural Index, Wildlife Review, Zoological Record, and Biological Abstracts. For our "sample topic" we will search for articles on Heloderma suspectum--the Gila Monster!

BIOLOGICAL AND AGRICULTURAL INDEX

Biological and Agricultural Index is an easy-to-use subject index to English language journals in the life sciences. Published by the H. W. Wilson Company (which also publishes the Reader's Guide to Periodical Literature, which you may already be acquainted with) this index began in 1916 under the title Agricultural Index, changing to the present title in 1964. It is published monthly (except in August) and is cumulated annually. Approximately 195 journals are indexed. Some representative journal titles are American Midland Naturalist, Auk, Journal of Mammalogy, Journal of Wildlife Management, and Transactions of the American Fisheries Society. Biological and Agricultural Index is what librarians call a "one-step" index. All this means is that once you find the appropriate subject heading for your topic, the citations (or bibliographic references) will be listed immediately below. So, for our topic--the Gila Monster--we simply find the subject heading "Gila monsters" and there you see listed one article. (**Transparency**) Let's quickly go over the parts of a bibliographic citation again. Here the title of the article is listed first. Next you see the author (or authors) name. Next, you see some uncapitalized abbreviations. These are "notes"--they tell us, for example, that this article has a bibliography and is illustrated. The next thing you see are some capitalized abbreviations. These are the journal title abbreviations. All abbreviations used in this index are listed in the

front of each issue and/or volume. By consulting the list of abbreviations we find that the title of the journal is Veterinary Medicine. The rest of the citation tells us that the article is in volume number 75, on pages 1050-1052, and was published in June of 1980. With the exclusion of the "notes," this is an example of a basic bibliographic citation. When you write research papers, you should always include the basic bibliographic information for each article you use in the list of references or bibliography at the end of your paper. (The exact format for the bibliographic citation can vary. Different journals have different although for the most part, very similar, "styles" that they require their authors to follow. In the final library unit assignment we will be asking you to follow the style required by the Journal of Wildlife Management.) The first time that you run into an incomplete citation from someone else's bibliography (or even from an index) you will see how important it is to have at least the basic bibliographic information. Well, back to the main subject! . . . . . Biological and Agricultural Index is an easy-to-use index. It covers a core group of English language journals in the life sciences but does not provide abstracts of the articles. The UA Library suscribes to most of the journals indexed. ARE THERE ANY QUESTIONS?

WILDLIFE REVIEW

Okay, let's move on to the next index--Wildlife Review. This index is published by the U.S. Department of the Interior, Fish & Wildlife Service. It began publication in 1935. Wildlife Review provides coverage to the world-wide literature of wildlife management and conservation, picking up journal articles, conference papers, dissertations, and government publications. It comes out quarterly and, as of 1981, is cumulated annually. Prior to 1981, the only cumulations for the quarterly issues were the five year cumulative

volumes which appeared under the title Wildlife Abstracts. That made it rather tedious if you wanted to cover several years of the literature. Between five year cumulations you would have to go through 4 separate indexes to cover one year's time. Fortunately, there are now annual cumulative indexes. A curious fact about Wildlife Abstracts (the five year cumulation of Wildlife Review)--there are no abstracts! In the early volumes of Wildlife Review there were some abstracts and apparently that was the basis of the title of the 5 year cumulative volumes. However, there are no longer any abstracts in either Wildlife Review or Wildlife Abstracts.

Enough of the big picture--how do you use this index? Well, in contrast to Biological and Agricultural Index, this index is what we call a "two-step" index. No, this is not a lesson in country swing! What this means is that getting to the bibliographic citation involves a two-step process. First--you consult either the author, geographic, or subject index which appears in the back of each quarterly issue. If you are using the annual or 5-year cumulative indexes you have, in addition to the above mentioned indexes, systematic indexes (arranged by scientific name) for birds, mammals, and amphibians & reptiles. Each article referenced in any of these indexes has a unique citation number. With that number you take "step-two," which is to look up the number in the separate citation section of that issue or volume. There you will find the bibliographic citation (author, title, etc.). Here is how we found an article on the Gila Monster using the systematic index of Wildlife Review. (***TRANSPARENCY***) When using the annual cumulative index, remember that the index is a separate volume from the citation volumes. Just make sure that you take the citation number from the annual index volume to the citation volume for the same year.

ARE THERE ANY QUESTIONS ABOUT WILDLIFE REVIEW AND/OR WILDLIFE ABSTRACTS?

ZOOLOGICAL RECORD

Zoological Record is another two-step index but there are some differences as compared to Biological and Agricultural Index and Wildlife Review which I would like to point out as we go along.

Zoological Record began publication in 1864. You can search 120 years of literature with this index! The publishers claim (and no doubt, with reason) that Zoological Record is " . . . the world's largest taxonomic index to the zoological literature." Each annual volume includes 25 separate sections dealing with different animal groups (Aves, Mammalia, Reptilia, etc.; plus two other sections--one covering general zoological literature, and the other listing new generic and subgeneric names indexed in the first 25 section. Each section is composed of five different indexes: author, subject, geographical, paleontological, and systematic. The author index is the main index where you find the bibliographic citations listed. All other indexes refer back to the author index. Let's see how this works using the geographical index in the Reptilia Section of Zoological Record. We are looking for articles on the Gila Monster in Arizona. (***TRANSPARENCY***) As you can see, to use the geographical index you need to know the zoo-geographic region of the area you are interested in. Arizona is in the Nearctic region. Under the heading for Arizona we scan down the titles until we see the scientific name--Heloderma suspectum. This article happens to be about the climbing activity of the Gila Monster in Pinal County, Arizona. You'll notice that the author's name is "Cross, J.K. et al." With that name you go from the geographical index to the author index of the Reptilia section where, under "Cross, J.K. & Rand, M.S." you find the bibliographic citation to the article.

ARE THERE ANY QUESTIONS ABOUT ZOOLOGICAL RECORD?

BIOLOGICAL ABSTRACTS

The last "index" I am going to talk about is actually an abstracting journal. Biological Abstracts is one of the major indexing and abstracting journals for the life sciences. It covers over 8,000 journals and serials from over 100 countries. Biological Abstracts is published bi-monthly and has semi-annual cumulated indexes. In addition to a keyword subject index there are generic, author, biosystematic, and concept indexes. Like Wildlife Review and Zoological Record, it takes two steps to get to the bibliographic citation in Biological Abstracts--and, in addition to the citation there is, of course, an abstract for each article. Let's use both the generic index and the keyword index to find an article on the Gila Monster.

The generic index is very straightforward. With the genus-species name you locate the abstract number. The code in the center column gives you an idea of the emphasis of the article. (In this case, the article deals with the toxicology of the Gila Monster.) The number in the far right column is the abstract number. With this number you go to the abstract volume for the same time period and there you locate the abstract (and bibliographic citation) for the article.

The keyword subject index is, at first glance, much more complicated to use. (In any case, it is somewhat complicated to explain.) Nevertheless, I'm sure after you try it once or twice you will find it easy to use. The keyword index uses a permutation process to create an index entry from every significant term (KEYWORD) in the title or term added to it. (Certain important terms that may not appear in the author's title are added by BIOSIS, the publisher. These include terms for such things as geographical location, instrumentation, apparatus, or methodology used, purpose of

experimentation, organism names, etc.) Text immediately to the right and left of the keyword is retained to provide SUBJECT CONTEXT for each keyword. Keywords are placed in the center of each column of the keyword index with the reference (or abstract) numbers appearing to the right of each line of the index. The slash indicates the end of the permuted line and the beginning of the author's title. In our example, you can see that we found the word "Gila" in the keyword column. Matching that with the subject context word "monster," we found the same article that was found using the generic index. You'll notice, further down in the list we have a reference to the Gila trout.

ANY QUESTIONS?

There are other indexes available in Biological Abstracts. The Bio-systematic Index contains broad taxonomic categories and is used to find items which refer to a particular Phylum, Class, Order, or Family of organisms. The Concept Index is used to find items relating to broad subject areas of biology. The Author Index, of course, is used to find items when specific personal or corporate names are known.

Before we leave our discussion of Biological Abstracts, let me point out the difference between Biological Abstracts and Biological Abstracts/ Reports, Reviews & Meetings, another index published by the publisher BIOSIS. The difference is in the types of publications covered, as you might have already guessed from the title of the second index. Biological Abstracts covers the research journal literature, while on the other hand, BA/RRM picks up other types of publications, such as annual reports, symposium papers, selected government reports, semi-popular journals, etc.

COMPUTER DATABASES

Okay, we've talked about four different indexes that you might use when doing research in wildlife and fisheries--Biological and Agricultural Index,

Wildlife Review, Zoological Record, and Biological Abstracts. There are many other relevant indexes, as you can see from the handout. You will find that most of the others, which we haven't discussed today, work in the same ways (either "one-step" or "two-step") that the ones we have discussed work. I would like, at this time to bring to your attention the fact that many of these indexes and abstracts are also available online--i.e. as computer databases. If you will look at the handout titled "Databases in Fisheries and Wildlife" you can see that several of the databases correspond to some of the printed indexes we have just discussed. For example, BIOSIS corresponds to Biological Abstracts and BA/RRM. (Online, the two printed indexes are combined.) Zoological Record is also available online, as well as Aquatic Sciences and Fisheries Abstracts and several others. There are some limitations, however. Most of the online databases go back only 10 or 15 years. In addition, there are charges for online searching and on the handout we have tried to give you an idea of what those costs might be for the various databases. Even so, there are many advantages to having a computer search done, the first probably being the speed at which you can cover so many years and the advantage of having a list printed out for you of the relevant citations. I don't really want to spend anymore time discussing this because for the average undergraduate the cost of a search, even if it only comes to $10 or $20 can be prohibitive, especially if it is only for a 5 page report. Most of the searches done at our library are done fo graduate students and faculty. Feel free, however, to come and talk to one of the reference librarians if you are interested in having a search done online.

CONCLUSION

In conclusion, let me say--It is very important to have an organized, methodical approach to gathering information whether you are writing a

paper for a class, giving a speech, or even just in order to be an informed citizen. Indexes and abstracts are valuable tools for achieving these goals and maintaining "control" over the proverbial (but all-too-real) "information explosion."

ASSIGNMENT HANDED OUT--"DISTINGUISHING BETWEEN POPULAR AND SCHOLARLY ARTICLES"

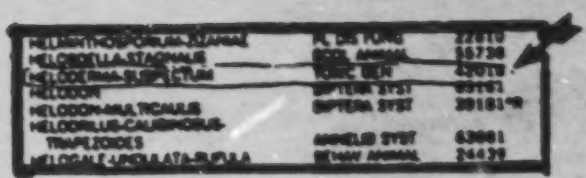
USING INDEXES & ABSTRACTS

TOPIC: THE GILA MONSTER, *HELODERMA SUSPECTUM*

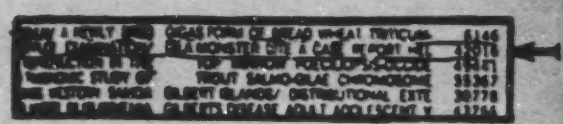
A. BIOLOGICAL ABSTRACTS

QH
301
B37
Sci Ref
(range 1)

GENERIC INDEX



KEYWORD INDEX



42016. ROLLER, JAMES A. (Div. Dermatol., Dep. Med., Univ. Mo. Med. Cent., Columbia, Mo., USA.) Gila monster bite: A case report. CLIN TOXICOL 10(4): 423–427. 1977.—Transient ECG abnormalities are described in a young man who was bitten by a Gila monster (*Heloderma suspectum*). The patient's pain subsided spontaneously without narcotics and the vascular status of his bitten extremity was monitored by Doppler examination. The patient was discharged in 24 h after conservative management.

BEST COPY AVAILABLE

AUTHOR INDEX IS ALSO AVAILABLE

B. BIOLOGICAL AND AGRICULTURAL INDEX

GILA monsters
Repair of abdominal hernia in a gila monster (heloderma suspectum) M. Curtis and others. bibl il Vet Med 75:1060-2 Je '80

C. WILDLIFE REVIEW

SYSTEMATIC INDEX

Heloderma suspectum
Bioenergetics
83-008013
Locomotion
83-008013
Surgery
83-007944
Temperature Relationships
83-008013

CITATION SECTION

83-008013 John-Alder, Henry B.; Charles R. Lowe and Albert F. Bennett. THERMAL DEPENDENCE OF LOCOMOTORY ENERGETICS AND AEROBIC CAPACITY OF THE GILA MONSTER (*HELODERMA SUSPECTUM*). *J. Comp. Physiol. B Biochem. Syst. Environ. Physiol.* 151(2):119-126. 1 June 1983. WR 190
[Dep. Dev. & Cell Biol., Univ. Calif., Irvine 92717]

BEST COPY AVAILABLE

). ZOOLOGICAL RECORD

QL
1
Z72
Sci Ref

SECTION 17

REPTILIA

1) GEOGRAPHICAL INDEX

Zoogeographic Region: Nearctic

Area of interest: United States, Arizona

Arizona

Altitudinal variation, life history & demography
Sceloporus jarrovi — BALLINGER, R.E. (193)
Awatovi
Archaeological site, faunal assemblages — OLSEN, S.J. (1635)
Chiricahua Mountains
Food availability & preferences, relationship
Sceloporus jarrovi — BALLINGER, R.E., ET AL (195)
Winter aggregations, energetics, temperature & water relations
Sceloporus jarrovi — CONGDON, J.D., ET AL (500)
Pinal County
Climbing activity
Heloderma suspectum — CROSS, J.K., ET AL (540)

ok for the genus-species name

AUTHOR

2) AUTHOR INDEX

Cross, J.K. & Rand, M.S. (540)
Climbing activity in wild-ranging Gila monsters, *Heloderma suspectum* (Helodermatidae).
Southwestern Nat. 24(4) 1979: 703-705.

Crowe, A. & Valk-Fal, T. (541)
The mechanism of spinal control of reflex hindlimb movements in the terrapin *Pseudemys scripta elegans*.
Journal Physiol., Lond. 292 1979: 19P.
[Abstr.]

BEST COPY AVAILABLE

WILDLIFE AND FISHERIES INDEXES AND ABSTRACTS

SH
1
A65
Sci Ref

Aquatic Sciences and Fisheries Abstracts. v.1- (1971-).
"An international information journal for the science, technology and management of marine and freshwater environments." Covers approximately 5,000 primary journals and a wide variety of other source documents. Published monthly with author, subject and taxonomic indexes. In 1978 this "journal" was split into two parts: ASFA Pt.1- Biological Sciences and Living Resources (SH 1 A651 Sci Ref) and ASFA Pt.2- Ocean Technology, Policy and Non-Living Resources (SH 1 A652 Sci Ref).

QH
301
B37
Range 1
Sci Ref

Biological Abstracts. v.1- (1927-).
BA is the major indexing and abstracting journal for the life sciences. It covers over 8,000 journals and serials from over 100 countries. In addition to a keyword subject index there are generic, author, biosystematic, and concept indexes. Short abstracts of the articles are provided.

Z
5231
B672
West Wall
Sci Ref

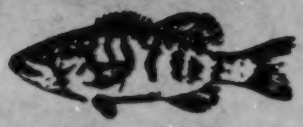
Biological Abstracts/RRM. (1980-).
BA/RRM (Reports, Reviews & Meetings) provides summaries of 125,000 books, book chapters, bibliographies, reports, reviews, and meetings annually. Previously titled Bioresearch Index (1965- 1979).

Index Table
E
Sci Ref

Biological and Agricultural Index. v.1- (1916-).
An easy-to-use subject index to English language periodicals in the life sciences. No abstracts.

QL
614
C87
Sci Ref

Current References in Fish Research. v.1- (1976-).
A title listing of fish research articles. Author, keyword, and scientific name indexes provide access to the citations. Covers over 350 scientific journals that publish fisheries information.



Index Table B
Sci Ref

Environment Index. v.1- (1970-).
An index to journals, books, conference proceedings, newspapers and government publications. Subject, geographic and author indexes provide basic bibliographic citations. If an abstract is needed, an accession number in the lower left hand corner of each citation provides the connection to the abstract in the corresponding volume of Environment Abstracts (also on Index Table B).

S
960
W55
Sci Ref

Keyword Index of Wildlife Research. v.1- (1974-).
Indexes approximately 400 wildlife periodicals. Keyword index provides reference numbers leading to the citation in the author-title index. A thesaurus (list of keywords) and an alphabetical and systematic species list in the back of each volume provide guidance in using the keyword index.

SH
1
S82
Sci Ref

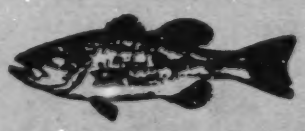
Sport Fishery Abstracts. v.9- (1964-)-
Published by the U.S. Fish and Wildlife Service, this index is "intended to furnish fishery biologists with abstracts of current literature in sport fishery research and management." Issued quartlerly with author, geographic and taxonomic indexes.

SK
351
U52
Sci Ref

Wildlife Abstracts. v.1- (1935-).
Published by the U.S. Fish and Wildlife Service, this index comes out every five years as a cumulation of citations which have appeared in Wildlife Review (see below) during that time. Except for early volumes, there are no abstracts. Access is provided through author, geographic, subject and systematic indexes.

SK
351
W5866
Sci Ref

Wildlife Review. v.1- (1935-).
A quarterly publication covering worldwide literature of wildlife management and conservation. Provides citations but no abstracts. Each issue has separate author, geographic and subject indexes. Beginning in 1981 an annual index volume with cumulative author, geographic, taxonomic and subject indexes has been published. Wildlife Abstracts (see above) serves to cumulate Wildlife Review on a five year basis.



QL
1
Z72
Sci Ref

Zoological Record. v.1- (1864-).
"...the world's largest taxonomic index to the zoological literature." Each annual volume of ZR includes 25 separate sections dealing with different taxonomic classes (Aves, Mammalia, etc.) plus two sections- one covering general zoological literature and the other, listing new generic and subgeneric names indexed in the other sections. Each section is composed of five indexes: author, subject, geographical, paleontological and systematic.

INDEXES TO THE POPULAR MAGAZINES

Index Table E
Sci Ref

Biology Digest. v.5- (1978-).
The audience for this reference tool is defined as "students and educators at the secondary school and undergraduate college levels". Many of the periodicals indexed do classify as scholarly research journals (ex. Journal of Wildlife Diseases, Journal of Range Management, etc.) Popular science magazines such as Animal Kingdom, Discover, Science 84, Sierra, as well as general magazines like Time and Newsweek, are also covered. Abstracts are provided.

Index Table E
Sci Ref

General Science Index. v.1- (1978-).
This index provides access to popular science magazines (Audubon, International Wildlife, Oceans, etc.) as well as to scholarly journals (American Midland Naturalist, Journal of Wildlife Management, etc.).

Index Table
Central Ref
Main Library

Magazine Index.
Provides access to articles in over 400 general and popular periodicals, including all those magazines indexed in Reader's Guide (see below). Available on microfiche for 1977-1979, on computer-output-microfilm (COM) for 1979-present. Available online (through UA Library Computer-Assisted-Reference Service) for 1959-present.

Index Table D
Sci Ref

Reader's Guide to Periodical Literature. v.1- (1900-).
"A cumulative author/subject index to periodicals of general interest published in the United States." Includes such titles as Field & Stream and Outdoor Life.

OTHER INDEXES -

The following indexes will provide access to the business, political, and social science aspects of fisheries and wildlife research.

Index Table I
Central Ref
Main Library

Business Periodicals Index. v.1- (1958-).
Cumulative index to English language periodicals in the business subject fields, including accounting, advertising and public relations, economics, management and personnel administration, etc. Relevant subject headings: "Environmental Policy", "Fishery Management", "Values", "Wilderness Areas", etc.

Z
5813
E23
Sci Ref
(Also in Central Ref.)

Education Index. v.1- (1929-).
Cumulative index to educational publications in the English language. Relevant subject headings: "Animals, Extinct", "Fishes-Habits and Behavior", "Geographical distribution of animals and plants", "Population (Biology)", "Wildlife Conservation", etc.

Index Table B
Sci Ref
(Also in Central Ref)

Psychological Abstracts. v.1- (1927-).
A specialized index which lists subjects in the field of psychology and related disciplines. Refers to scholarly journal articles and books. Provides abstracts. Relevant subject headings: "Consumer attitudes", "Conservation (Ecological Behavior)", etc.

Index Table B
Central Ref
Main Library

Public Affairs Information Service (PAIS) Bulletin. v.1- (1915-).
A selective subject list of the latest books, pamphlets, government publications, reports, and periodical articles relating to economic and social conditions, public administration, and international relations. Relevant subject headings: "Animals", "Fisheries", "Hunting", "Wildlife Conservation", etc.

Index Table D
Central Ref
Main Library

Social Sciences Index.
A cumulative index to English language periodicals, consisting of author and subject entries for the fields of anthropology, economics, environmental sciences, geography, law and criminology, planning and public administration, political science, etc. Relevant subject headings: "Rare animals", "Wildlife Conservation", etc.

DATABASES IN WILDLIFE AND FISHERIES SCIENCES

The following is a list of major databases that cover the wildlife and fisheries sciences, selected from more than 200 databases which are now searchable by computer. The name of the database, and its print counterpart where appropriate, is followed by an indication of relative cost (see below), subject areas covered and the dates of coverage.

Cost codes:

A = Less than $45.00 per connect hour
B = $45 - $75.00 per hour
C = More than $75.00 per connect hour

The actual cost of a search is determined by the connect time used, telecommunications costs, and print costs. The more time spent online, searching or printing, the higher the costs. A "rule of thumb" for estimating a typical search with 50 or fewer citations is $25.00. Costs will vary if more than one database is searched. (Faculty, staff, and students of the University of Arizona are eligible for a $10.00 discount.)

For additional information or to inquire about a search, please contact:

Doug Jones	621-6375
Robert Mautner	621-6386
Charlene Morse	621-6386
Jack Mount	621-6375
Jeanne Pfander	621-6392
Susanne Redalje	621-6392

or call the Science Reference Desk at 621-6384.

DATABASE	COST	SUBJECT	DATES OF COVERAGE
AGRICOLA Bibliography of Agriculture	A	AGRICULTURAL ECONOMICS, ANIMAL SCIENCES, ENTOMOLOGY, LAND USE, RANGE MANAGEMENT, WILDLIFE & FISHERIES.	1970-
AQUATIC SCIENCES & FISHERIES ABSTRACTS Aquatic Sciences & Fisheries Abstracts	C	OCEANOGRAPHY, FISHERIES LIMNOLOGY, MARINE BIOLOGY, AQUATIC BIOLOGY.	1975-
BIOSIS Biological Abstracts, BA/RRM	B	LIFE SCIENCES: MICROBIOLOGY, PLANT & ANIMAL SCIENCES, ECOLOGY, WILDLIFE, ZOOLOGY.	1969-
CAB	B	COVERS AGRICULTURE AND RELATED FIELDS FROM COMMONWEALTH AGRICULTURAL BUREAU'S 26 ABSTRACTING SOURCES.	1972-
ENVIROLINE Environment Index	C	AIR POLLUTION, LAND USE OCEANS, POPULATION PLANNING, WILDLIFE, URBAN ECOLOGY.	1971-
GPO MONTHLY CATALOG Monthly Catalog of U.S. Government Publications	A	FEDERAL GOVERNMENT PUBLICATIONS ON A WIDE VARIETY OF SUBJECTS INCLUDING FISHERIES AND WILDLIFE.	1976-
LIFE SCIENCES COLLECTION	B	COVERS THE LITERATURE OF THE LIFE SCIENCES. CORRESPONDS TO IRL'S 15 PRINTED ABSTRACTING SOURCES.	1978-
MEDLINE Index Medicus	A	MEDICAL AND RELATED FIELDS, INCLUDES VETERINARY MEDICINE AND WILDLIFE DISEASES.	1966-
NTIS Government Reports Announcement & Index	B	GOVERNMENT REPORTS IN ALL AREAS OF SCIENCE: LIFE AND PHYSICAL SCIENCES, MATH, ENGINEERING, COMPUTERS.	1964-

DATABASE	COST	SUBJECT	DATES OF COVERAGE
OCEANIC ABSTRACTS Oceanic Abstracts	C	OCEANS, FISHERIES, POLLUTION, ETC.	1964-
PSYCHINFO Psychological Abstracts	B	PSYCHOLOGY, BEHAVIORAL SCIENCES, ETC.	1967-
SCI SEARCH Science Citation Index	B	MULTIDISCLIPLINARY INDEX IN THE FIELDS OF SCIENCE & TECHNOLOGY. COVERS THE PURE & APPLIED SCIENCES.	1961-
ZOOLOGICAL RECORD Zoological Record	C	PROVIDES WORLDWIDE COVERAGE OF ZOOLOGICAL LITERATURE WITH PARTICULAR EMPHASIS ON SYSTEMATIC/TAXONOMIC INFORMATION.	1978-

(Adapted from an assignment reported in:
Williams, Ester. "Introduction to Science Literature: A Library Assignment for General Biology Students" Research Strategies 2 (2): 65-70. 1984.

ASSIGNMENT I

DISTINGUISHING BETWEEN POPULAR AND SCHOLARLY/SCIENTIFIC ARTICLES

A. Select a species from the list provided for your final assignment. It does not have to be the subject you choose for your final assignment, however.

B. Using an index to popular magazines or newspapers, locate a popular article on this subject. You may want to consult Reader's Guide to Periodical Literature (available in SEL), or The New York Times Index (in the Main Library only).

C. In what index did you find the magazine or newspaper article cited? Please give title, volume and page of the index used. Please provide the following information on the article you have selected:

-title of article
-author of article (if given)
-title of the magazine or newspaper, volume number, date, and page.

D. Please read this article.

E. Then, using an index to scientific or scholarly journals, find a scholarly or research article on this same general topic. You may want to look by subject, or you may be able to find an article written by a scientist who was referred to or who was quoted in the popular article.

F. In what index did you find the journal article cited? Please give title, volume and page of the index used. Please provide the following information on the article you have selected:

-title of article
-author of article
-title of journal, volume number, date, and page.

G. Please read this article.

(OVER)

H. The following questions will assist you in comparing the two articles. Please answer in written form questions one through seven based on your examination of the popular article.

1. What is the objective of this article?
2. To what audience is it directed?
3a. Are the author's credentials included in the article or in the journal issue?
3b. If yes, please describe his/her authority to write on this subject.
4a. Are there references to earlier or related research studies?
4b. If yes, how are they cited within the text of the article?
4c. If no, how is background information presented?
5. If applicable, briefly describe research methodology referred to in this article.
6. What are the conclusions drawn by the author?
7. Is there a bibliography or list of references included with this article?

I. Next answer in written form these same seven questions based on your examination of the scholarly article.

J. Finally, note any discrepancies in basic information presented between the two articles.

K. Please photocopy the list of references, literature cited, or bibliography provided at the end of the scholarly/scientific article and attach this to this written assignment.

DUE ON OCTOBER 19th

UNIT III

GOVERNMENT DOCUMENTS

Many people are put off by the thought of using government documents. They seem somehow to be mysterious, official, and hard to locate. Because of the way we acquire them and because of the special formats and classification system used, they are usually kept in a separate department in the library. But this has more to do with bibliographic control than how they should be used.

Let's start with the basics--what is a government document? Well, government documents are generally defined as those publications issued by a governmental body (federal, state, local, or international) and made available for public use. Government documents come in a variety of formats including pamphlets, journals, microforms and book volumes. This definition does not include classified information or information which is deemed to be not of public interest. However, there isn't much that the federal government doesn't think is in the public interest. (Here show some examples which illustrate both the variety of formats--from pamphlets to books--and the scope--from fish recipies to research and environmental impact statements.)

Why are government documents important? The United States Government Printing Office is the largest publisher in the world. Each year this Office issues publications in a wide range of subject areas, especially the sciences, social sciences, and public affairs. The information available through government documents will often supplement that available through other sources. The results of any research undertaken jointly by the federal government and a public or private organization will be published as a government document. Some information, such as the official records of the federal government (laws, congressional hearings, presidential papers), is

available only through government documents. I know that scientists often gather their information through informal networks, and government documents are often missed by these networking systems.

How does the library acquire documents? In 1895 the depository system for United Stated federal documents was created by Congress. This law stipulates that regional depository libraries, such as the U of A, will receive most of the important publications of the federal government automatically and for free. Our federal documents collection contains over 800,000 printed items and 750,000 microforms.

There is far less control over state, county, and city documents. No similar depository system exists for these documents, so in order for the library to acquire them, librarians must seek out these publications and order each one separately. This is why those documents which seem close to home can be harder to get your hands on. The U of A Library has a librarian who is in charge of bringing local documents into the collection and providing access to them.

Where are government documents kept? Most U.S. federal publications are kept in a separate collection in the Government Documents Department on the third floor, section A, of the Main Library. The publications of a few agencies, such as NASA and the Department of Energy are kept in the Science-Engineering Library, but most of the documents which pertain to wildlife and fisheries science will be in the Main Library. Most of these documents can be checked out.

Arizona state, county, and city documents are kept in the Special Collections Department which has its own entrance on the second floor, section C, of the Main Library. These documents cannot be checked out, but they can usually be photocopied.

Documents from other states will usually receive a regular call number and be shelved with other library materials.

ANY QUESTIONS SO FAR ABOUT DOCUMENTS?

Now we're going to talk about finding documents in the library. At this point we are talking only about federal documents. Look at the handout with the title Finding Government Documents. This shows you that if you know the title and issuing agency of a particular document, you can use the card catalog in the documents department to locate this publication. If you know only the title, you will need to use the Monthly Catalog title index (more about this index later). If you are interested in finding out what the government has published on a particular subject you will need to use the subject and/or keyword indexes to the Monthly Catalog, and other appropriate indexes.

Suppose you are investigating the relationship between grazing lands and wildlife habitats. Your professor knew of a couple of documents that would help you. He gave you the citation on the handout. Before we go any further, is everyone clear about what I mean by the term citation? (If not, explain.) Very little of the documents collection can be accessed through the card catalogs in either Main or SEL. Only the most popular titles such as the recent A Nation at Risk can be found this way. To find federal documents you must use the access tools in the Government Documents Department. So if you know the issuing agency, which is essentially the author, and the title of a publication, you can use the card catalog in the Government Documents Department to locate it. This card catalog works a little differently from the card catalogs in SEL or Main. The cards in this catalog are arranged by issuing agency. At this point, we need to discuss SuDocs numbers. Look at the handout entitled How to Use the Documents Card Catalog. (Continue

explanation reading from this handout.) Included in your packet of handouts is one which lists the SuDocs stem numbers for those agencies most likely to publish wildlife and fisheries related material.

Suppose you don't find this document in the card catalog. You could have the wrong information, or maybe you only know the title of the document. At this point, you need to turn to the major indexing service for federal documents--The Monthly Catalog. The Monthly Catalog works in a very similar fashion to those two-step indexes you have used already such as Biological Abstracts. The Monthly Catalog covers all publications issued by the Government Printing Office. (Explain how to use Monthly Catalog by using handout.)

In addition to the title and subject indexes, you should be familiar with the keyword index. The subject index uses what we call controlled vocabulary. You must choose your subject headings from a specified list (The Library of Congress Subject Headings that you used for the subject card catalog). With keyword indexing, all important words in a title are indexed, thereby providing more specific access to publications.

If the citation includes a large black dot (see example), we should have this publication. Take down the SuDocs number and head for the stacks--unless the entry tells you that the publication is on microfiche. These documents are also arranged by SuDocs number in the metal cabinets along the south wall. If we don't happen to own a particular document that you want, you can order it if it has a GPO stock number. Ordering information is available in the front of Monthly Catalog volumes. Consult a reference librarian if you have any questions.

ANY QUESTIONS?

In addition to the Monthly Catalog, there are a number of other indexes which include government documents. Several of these are outlined on the handout entitled Additional Indexes. Let's take a few minutes to talk about these different indexes. (Discuss, using handout).

Climatological data is also housed in the Government Documents Department. One thing to keep in mind when using this data is that it doesn't exist for the same years for every state.

Now that you know everything you ever wanted to know about federal documents, let's go back to local documents for a few minutes. As I said earlier, they are all kept in the Special Collections Department. For all those documents which have been fully processed, there will be cards in the Main card catalog, just as there are for regular books. However, publications issued by corporate bodies such as states can sometimes be tricky to find. The rules by which we file cards in the catalog have changed recently, making things a little more challenging but by no means impossible. Under the old rules we used to file publications issued by the University of Arizona under "Arizona. University." Following the new rules, we now file these publications under "University of Arizona." (Write examples on board.) This means that you will need to look in two places to make sure you haven't missed anything. Never hesitate to ask a reference librarian for help if you aren't sure what the correct entry should be. Cards for all local publications are also filed in the catalog in the Special Collections Department. In fact, this catalog will have more cards than the Main catalog because while materials are awaiting full processing there will be no card in the Main Catalog, but there will often be a brief entry card placed in the Special Collections Catalog so that you know we own those items. Another excellent way to access these publications is to ask the staff in the Special Collections Department for assistance.

They often know or will check on what has recently been received from a particular agency. Unfortunately, there is not an index equivalent to the Monthly Catalog for local publications.

ANY QUESTIONS?

The last handout is the assignment for this unit. You have one week in which to complete this assignment. For the first question, you should use the card catalog in the Government Documents Department. For the second, you will need to locate a publication in the bookstacks in this department. The third question asks you to use the Monthly Catalog and another index of your choice. Assistance is available at the reference desk if you need it.

If there are no more questions, we will now take a short tour of the Government Documents Department.

INTRODUCTION TO GOVERNMENT DOCUMENTS

What is a government document?

Government documents are generally defined as those publications issued by a governmental body and made available for public use. Government documents come in a variety of formats including pamphlets, journals, microforms, and book volumes.

Why are government documents important?

The United States Government Printing Office is the largest publisher in the world. Each year this Office issues publications in a wide range of subject areas, especially the sciences, social sciences, and public affairs. The information available through government documents will often supplement that available through other sources. The results of any research undertaken jointly by the federal government and a public or private organization will be published as government documents. Some information, such as the official records of the federal government (laws, congressional hearings, presidential papers), is available only through government documents.

How does the library acquire government documents?

In 1895 the depository system for United States federal documents was created by Congress. This law stipulates that regional depository libraries, such as the U of A, will receive most of the important publications of the federal government automatically and for free. Our federal documents collection contains over 800,000 printed items and 750,000 microforms.

There is far less control over state, county and city documents. No similar depository system exists for these documents, so in order for the library to acquire them, librarians must seek out these publications and order each one separately. This is why those documents which seem closer to home can be harder to find.

Where are government documents kept?

Most U.S. government publications are kept in a separate collection in the Government Documents Department on the third floor, section A, of the Main Library. The publications of a few agencies, such as NASA and the Department of Energy, are kept in the Science/Engineering Library, but most of the documents which pertain to wildlife and fisheries science will be in the Main Library. Most of these documents can be checked out.

Arizona state, county, and city documents are kept in the Special Collections Department which has its own entrance on the second floor, section C, of the Main Library. These documents cannot be checked out, but they can usually be photocopied.

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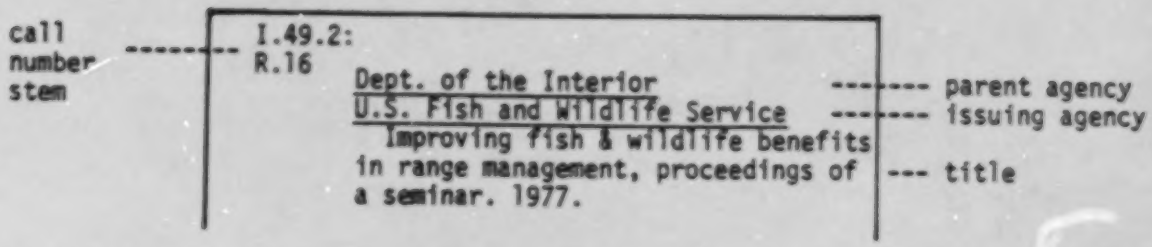
FINDING GOVERNMENT DOCUMENTS

IF YOU KNOW:	THEN:
Title & Issuing Agency (ex: Dept. of the Interior. U.S. Fish and Wildlife Service. Improving Fish and Wildlife Benefits in Range Management; Proceedings of a Seminar.1977.)	1. Use the card catalog in the Government Documents Department. 2. Consult the handout on how to use this catalog. 3. If you don't find it in this card catalog consult the Monthly Catalog by title.
Title	1. Use the title index to the Monthly Catalog
Subject	1. Use the subject index to the Monthly Catalog (Determine correct subject headings using LCSH) 2. Use the keyword index to the Monthly Catalog 3. Consult any other appropriate indexes such as the Congressional Information Service, the American Statistics Index, or Government Reports Announcements and Index

HOW TO USE THE DOCUMENTS CARD CATALOG

The Documents card catalog can be used effectively only if you know which government agency issued (or was likely to have issued) the document(s) you are looking for. (NOTE: If you are seeking information in a general subject area, it is best to use the Monthly Catalog or one of the other excellent indexes in the Documents Reference Area which offer subject access to the collection.)

SAMPLE DOCUMENT CARD



The SuDocs Number

The publications on the shelf in the Government Documents Department are arranged according to a special numbering system called the Superintendent of Documents classification system, or "SuDocs" for short. This is a third major classification system used by the U of A Library and SuDocs numbers should not be confused with or mistaken for Dewey Decimal or Library of Congress classification numbers.

The SuDocs number is a series of letters, numbers, and punctuation marks (examples: Pr 36.9: P 85/2 and Y4.In 8/14: 97-85) which identifies the issuing agency, series, and specific item within the series of each document for which a SuDocs number has been assigned. The principal difference between SuDocs numbers and Dewey Decimal or Library of Congress numbers is that SuDocs numbers group publications by issuing agency rather than by subject.

Don't let the unusual appearance of the SuDocs call number confuse you. The SuDocs system is just another alphabetical/numerical arrangement; if you know the alphabet and can count, you can locate documents shelved in SuDocs order!

Arrangement of cards in the catalog

a) The cards in this catalog are arranged first by the distinctive call number system of the issuing agency. The sample card, along with the other cards for publications of the Fish and Wildlife Service, will be filed together under the stem "I49". All of the cards beginning with the stem "I49" will be filed after those beginning with the stem "I48" and before those beginning with the stem "I52".

b) Within the group of cards beginning with "I49" (i.e. documents issued by the Fish and Wildlife Service), individual cards are filed alphabetically by the title of the document. Some cards do not include agency name but start with the title.

c) The card group for each agency begins with a raised guide card listing, from left to right, the call number stem, corresponding agency name, and where known, the span of years during which the agency was active. Call number stems of agencies are often subject to change, and where this

has occurred within a given agency's history, you will find a listing of earlier and/or later call number stems typed below the agency name. For example, the Fish and Wildlife Service has also included two other bureaus during its existence: the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife.

Finding the call number stem assigned to a particular agency

To determine the appropriate call number stem for the agency you are looking for, consult the pamphlet titled Index to Current Federal Agencies and Their Corresponding Call Numbers, which is located on the top shelf to the right of the card catalog. This list is arranged by the first key word in each agency name (e.g. U.S. Fish and Wildlife Service would be found under Fish and Wildlife Service), and includes only those agencies currently in existence. A member of the Documents staff will be glad to assist you if you are having trouble determining the call number stem for a given agency.

Finding the document you want in the stacks

Write down the entire call number of the document you are looking for. The call number is located in the upper left hand corner of each catalog card. In the sample above, the entire call number is "I.49.2:R.16". Material in the Document stacks is shelved in alphabetical and numerical order according to the call number -- the "I's" come before the "J's", and the "I49's" come after the "I38's", but before the "I52's". Please note that many documents listed in the catalog are not located in the Document stacks. These publications are distinguished by Library of Congress or Dewey Decimal call numbers; by the designation of a specific library location (e.g., Special Collections); or by one of the following color codes:

Blue ----- Documents reference material; consult Documents staff for exact location.
Green ----- Law Library
Red ----- Other specified location; consult staff if exact location in unclear.

Finding documents not listed in the card catalog

Not all materials in the Documents collection are listed in the Documents card catalog. Some are listed only by series number rather than by individual title (e.g., individual titles in the Fish and Wildlife Service Circular); and others are not listed at all. Important exclusions are: printed congressional hearing and committee prints; and most of our extensive microfiche holdings. If you encounter any sort of difficulty in locating the material you need, please don't hesitate to ask a member of the Documents staff for assistance.

THE MONTHLY CATALOG

U.S. government documents are indexed in a publication entitled Monthly Catalog of United States Government Publications (commonly called the Monthly Catalog). Although many of the more popular documents are included in the Geac circulation system and can be retrieved by title, the vast majority of government documents are not listed in Geac or the card catalogs in the Science/Engineering or Main libraries. Therefore, the Monthly Catalog is the basic source for finding out what the federal government has published. State and local publications are not included in the Monthly Catalog.

The Monthly Catalog, as the title indicates, is issued on a monthly basis. Each issue is divided into a citation section (located in the front half) and an index section (located in the back half). Documents are indexed by subject, author, title, title-keyword, and report number. Semi-annually, and then annually, these indexes will cumulate; that is, the individual monthly issues will be combined into one sequence. When this occurs, the indexes will be bound together in separate volumes from the citation sections. This means that you need look in only one volume to see everything that has been published during that year rather than looking in twelve individual monthly issues.

Because the Monthly Catalog is divided into two sections, it is a two-step index: you must first find a reference to the title of a relevant document in the light green **INDEX** volume and then refer to the appropriate dark green **CITATION** volume to find the complete bibliographic information on this document.

Monthly Catalog Subject Index Volumes

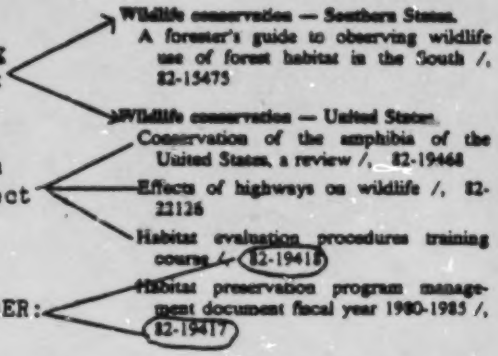
The Monthly Catalog Subject Index uses Library of Congress subject headings. These are the same subject headings that are used the Subject Card Catalog.

EXAMPLE:

Subject headings in the Monthly Catalog Subject Index are printed in bold face:

Titles of documents pertaining to each subject are listed underneath the subject heading:

Each title is followed by an ENTRY NUMBER:


Wildlife conservation — Southern States.
A forester's guide to observing wildlife use of forest habitat in the South /. 82-15475
Wildlife conservation — United States.
Conservation of the amphibia of the United States, a review /. 82-19468
Effects of highways on wildlife /. 82-22126
Habitat evaluation procedures training course /. 82-19418
Habitat preservation program management document fiscal year 1980-1985 /. 82-19417

Each of the other indexes will also give you an entry number which will lead to the complete bibliographic citation in the citation volumes.

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Monthly Catalog Citation Volumes

Each bibliographic citation in the Monthly Catalog is given its own unique ENTRY NUMBER. Citations are arranged in the dark green citation volumes in entry number order.

EXAMPLE:

In addition to the ENTRY NUMBER, each citation contains the following elements:

SuDocs Number

Title

Issuing Agency

Publishing Information

Subject headings under which a reference to this document can be found in the Subject Index volume.

83-19418

I 49.2:H 11/4

Habitat evaluation procedures training course / presented by the Habitat Evaluation Procedures Group, Western Energy and Land Use Team, Office of Biological Services ; in cooperation with Division of Ecological Services, Fish and Wildlife Service, U.S. Department of the Interior. — Fort Collins, Colo. : The Group ; Washington, D.C. : For sale by the Supt. of Docs., U.S. G.P.O., [1980?] 1 folded sheet (4 p.) : ill. ; 22 cm. ●Item 612 S/N 024-010-00570-0 @ GPO $2.00 1. Wildlife habitat improvement — United States. 2. Wildlife conservation — United States. I. Western Energy and Land Use Team. Habitat Evaluation Procedures Group. II. U.S. Fish and Wildlife Service. Division of Ecological Services. OCLC 08534847

Here's how to look up a specific subject in the Monthly Catalog:

STEP 1: Determine the appropriate Library of Congress Subject Heading(s) for your topic.

STEP 2: Look up these subject headings in the light-olive green Subject Index volume of the Monthly Catalog.

STEP 3: Determine which of the titles listed under these subject headings are best for the kind of research you're doing.

STEP 4: Copy down the entry number for each title you've selected. These are the numbers that follow each title in the Subject Index.

STEP 5: Go to the dark green citation volumes of the Monthly Catalog. Note that there is more than one of these volumes. Determine which volume contains the entry number you're looking for by looking at the spine of each citation volume. The entry numbers contained in each volume are noted on the spine.

Entry numbers are listed in numerical order, with each entry number located at the top left corner of the citation (see example above).

STEP 6: Look carefully at the citation of the document. If it appears to be pertinent to your subject, write down the SuDocs number of the document. Remember that the SuDocs number is the call number for the document. In the Monthly Catalog, it appears in bold print at the top center of the citation.

Federal Agencies

A Department of Agriculture

A13 Forest Service

C Department of Commerce

C55 National Oceanic and Atmospheric Administration (NOAH)

C55.100 National Weather Service
C55.200 National Environmental Satellite, Data, and Information Service
C55.300 National Marine Fisheries Service
C55.400 National Ocean Service

EP Environmental Protection Agency (EPA)

I Department of the Interior

I19 Geological Survey
I29 National Park Service
I49 Fish and Wildlife Service
I53 Bureau of Land Management

NS National Science Foundation

PrEX 14 Council on Environmental Quality

SI Smithsonian Institution

Y3.F31/22 Federal Committee on Ecological Reserves

Y3.M33/3 Marine Mammal Commission

Y3.M58: Migratory Bird Conservation Commission

Y4.En2: Senate Committee on Energy and National Resources

Y4.In8/14: House Committee on Interior and Insular Affairs

Y4.M53: House Committee on Merchant Marine and Fisheries

Environmental impact statements are usually published by one or another branch of the Interior Department, but can originate in almost any agency.

State Agencies

Ariz. Outdoor Recreation Coordinating Commission
Ariz. State Parks Board
Ariz. Environmental Planning Commission
Ariz. Pesticides Control Board
Ariz. State Land Department
Ariz. Department of Water Resources

Additional Indexes

CIS/Index

There are nearly 300 congressional committees, subcommittees and special offices which produce a vast number of publications each year. The Congressional Information Service produces an index called CIS/Index which covers all of the various publications of these bodies except for any action which takes place on the floor. The types of congressional publications covered include hearings, committee prints, House and Senate reports, documents, executive reports, treaty documents, public laws and some special publications. Any action which takes place on the floor is covered by the Congressional Record.

The CIS/Index is issued monthly in two sections. The Index section contains subject, title, bill number, report number, and document number indexes with references keyed to abstract accession number.

Many of the publications included in the CIS/Index are received by the library in paper copy. These are indicated by a large black dot in the abstract. If you want to see one of these publications, copy down the SuDocs number and year and proceed to the shelving area. If there is no black dot in the abstract, we will only have the item on microfiche. To find these items copy down the abstract accession number and the year and go to the cabinets numbered 37-42 where the microfiche are arranged by year and then abstract number.

Government Reports Announcements and Index

Government Reports Announcements and Index (GRA & I) is the index to material published by the National Technical Information Center (NTIS). NTIS is the central source for the public sale of U.S. Government-sponsored research and development, and engineering reports, and for foreign technical reports and the other analyses prepared by national and local government agencies and their contractors or grantees. Essentially this means that information about projects undertaken with the aid of Federal money will be published in the form of technical reports and made available through NTIS.

Your key to these reports is GRA & I which is issued every two weeks and includes the following indexes: keyword, personal author, corporate author, contract number, grant number, report number and NTIS number. GRA & I is arranged differently from any index you have encountered so far. The entries are broken down into 22 broad subject catagories and further separated into 178 subcategories. Unless you just want to browse one of these catagories, the easiest way to find information on your subject is by using the keyword index to get abstract numbers and then looking up the abstract numbers.

If you find something you want to read, copy down the complete citation including the NTIS number. Most of the NTIS publications are issued on microfiche and kept in the Current Periodicals and Microforms Room in the Science/Engineering Library. There are copies of GRA & I in both the Government Documents Department and the Science/Engineering Library Reference Room.

American Statistics Index

The American Statistics Index (ASI) is the master index and abstracting service for the statistical publications of the U.S. Federal Government. Since so many government publications include statistical information of some sort, the scope of the ASI is very broad. It covers recent statistics for such things as conservation program activities, environmental impacts of energy exploration, Federal government expenditures for wildlife programs, endangered species status, pesticide concentrations in fish, and R&D grants for fish and wildlife research. It does not include highly technical studies, scientific and experimental observations, or animal laboratory studies. These data are disseminated through such sources as the National Technical Information Service and others.

ASI is located in the Government Documents Department Reference area. This is a two-step index and works the same way as the Monthly Catalog. Begin with the ASI Index volume, copy down the abstract numbers for those publications you are interested in, and then turn to the ASI Abstracts volume.

As with CIS/Index, we automatically receive many of the publications which contain these statistics in paper copy. A black dot in the abstract will point these out. If there is no black dot, the publication will be on microfiche in cabinets 47-48. These are arranged by year and abstract number.

Statistical Reference Index

The Statistical Reference Index (SRI) is the major indexing and abstracting service for statistical publications from private organizations, business, and state government sources. In many cases these publications complement or fill important gaps in data prepared and issued by the Federal government. Statistics are provided on such subjects as wildlife conservation, endangered species, hunting and trapping, wildlife refuges and zoological parks.

The SRI is located in the Government Documents Reference area and on Table A in the Central Reference Department. The SRI is also a two-step index and is used in the same manner as ASI. However, almost all of the publications included in the SRI are issued on microfiche and housed in the Current Periodicals, Newspapers, and Microforms Room (CPNM) on the first floor. The microfiche number for this set is 794, and the fiche themselves are arranged first by year and then by abstract number. Some of the publications are available in paper copy - check the card catalog by author or title.

GOVERNMENT DOCUMENTS DEPARTMENT
ASSIGNMENT

1. For a project you are doing, your professor has suggested that you read a publication entitled _____

_____

_____.

He thinks it was published by the _____

_____.

Does the U of A Library own this publication? _____yes _____no

If so, what is it's call number? _____

2. Your classmate was browsing the stacks in the Government Documents Department when he came across a publication that would be valuable to a paper you are writing. He wrote down this call number: _____

What is the title of this publication? _____

_____

3. You are doing research on _____.

Use the Monthly Catalog and one of the following indexes to find two current publications on this subject (one from each).

Government Reports Announcement and Index
Congressional Information Service
American Statistics Index
Statistical Reference Index

1st complete citation: _____

_____

_____

Source and subject headings used: _____

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2nd complete citation: _____

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Source and subject headings used: _____

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UNIT IV

KNOWN ITEM SEARCHING

INTRODUCTION

Known Item Searching is the term generally used when you have a reference or citation "in hand." You may have obtained this reference from the bibliography which follows an article or paper. You may have found it through use of an index or an abstract or another form of reference tool or even the card catalog. We call it "known item searching" because you know that . . . or have reason to believe that the item you are searching for exists and is available somewhere--you have a reference to it.

Your reference may be to a book or journal or to a government document which we have examined and discussed, or it may be to a thesis or conference paper.

Conference proceedings are the published transactions of conferences, meetings, or workshops. For example, copies of papers which were presented at the North American Wildlife and Natural Resources Conference are what we generally refer to as conference reports. The proceedings of the Gray Partridge Workshop, held at the University of Idaho, as part of the Wildlife Society's Wildlife Management Institute, is as well.

Theses and dissertations are the papers which have been written by Master's or Doctoral students in support of their degrees. You may be especially interested in theses and dissertations accepted for academic degrees at the University of Arizona.

It is important to be able to distinguish between the various forms of citations such as books, journal articles, government documents, conference proceedings, and theses. The following citations are representative of the kinds of references you may easily encounter. Let's look at some of

their distinguishing characteristics. (See Handout--Typical Citations)

ABBREVIATIONS

Abbreviations are often difficult to interpret and provide one of the biggest stumbling blocks to successful known item searching. "Libraries, publishers, and government agencies all contribute to the confusion, in what H.L. Menken calls the characteristic American habit of reducing complete concepts to starkest abbreviations."* It is frustrating to have a citation but not be able to determine the correct title of the journal or identify the sponsor of an important conference. There are, however, several sources which you can use for assistance. (Speaker goes over handout--Abbreviations Unraveled. Go over several examples from this handout. Discuss scope, coverage, general format.)

Once you have unraveled your abbreviations you are ready to determine if the University of Arizona Library has this item. Unfortunately there are times when problems arise simply from the nature of bibliographic citations, the nature of serials publishing, the nature of library cataloging and catalogs, or, in other words, the nature of the beast. (Speaker discusses handout--Serials Problems or the Nature of the Beast.)

Once you have a correct citation it is time to determine if it is available in the University of Arizona Library. (Discuss handout--How to Find Journals in the Science-Engineering Library.)

CONFERENCE REPORTS

Over 10,000 scientific meetings take place each year. About 75% of the conferences, seminars, symposia, conventions, etc. result in a published record of the papers presented.

---

*Crowley, Ellen T. Acronyms, Initialisms, and Abbreviations Dictionary, Detroit, MI: Gale Research Co., 1983-1984.

Often citations are incomplete. Access tools, like the card catalog, are often inconsistent in their treatment of conference papers. Information may be cataloged under the name of the conference, the name of the editor, or the sponsoring agency.

One must have the complete citation to order it through ILL. Sometimes you may not even be certain it has been published. There are special sources which are a valuable aid in obtaining complete conference information.

Z
7409
D56
Sci
Ref

Directory of Published Proceedings: Series SEMT-Science/Engineering/Medicine/Technology. v. 1- . White Plains, NY: Interdok Corp. 1965.

The Directory of Published Proceedings is a bibliographic directory of preprints and published proceedings of congresses, conferences, symposia, meetings, seminars, and summer schools that have been held world-wide from 1964 to date. Issued monthly, with annual cumulations, it is arranged chronologically by the date of the conference. Information includes the name of the meeting, the principle sponsors--including universities. Bibliographic information includes publisher or distributor, order of information, title and series of journal of publication. Indexing is by keyword in the name of the conference, the sponsors, and the title.

Q
158.5
I52

Index to Scientific and Technical Proceedings. v. 1- . Phila. PA: Institute for Scientific Information Inc., 1978- . Monthly with semiannual cumulations.

The Index to Scientific and Technical Proceedings indexes conference literature in science to the article level. Nearly 90,000 papers published in 3,000 volumes of proceedings are indexed annually. International coverage for proceedings published in books, reports, or journals. Arranged in seven sections, the table of contents of each proceeding is reproduced in the main section. The remaining six sections index the information by author's name,

conference sponsor, subject category, meeting location, title words, and author's organizational affiliation.

Index to Scientific and Technical Proceedings provides a number of ways to locate the proceedings:

-Use Meeting Location Index if you know where it took place.

-Use Sponsor Index if you know the organization which put it on.

-Use Category Index if you know the general subject.

-Use Permutem Subject Index if you know a key word from the title.

-Use Author/Editor Index if you know an author of the paper or the editor or the proceedings.

-Use Corporate Index if you know a presenter's organizational affiliation.

THESES AND DISSERTATIONS

You may be interested in examining the theses of graduates of the University of Arizona. Perhaps you have heard that a study was done on natural resource values in Arizona, or mainstreaming outdoor recreation, or habitat analysis of Spring-Summer Elk range on the Apache-Sitgreaves National Forest. You may have the name of an individual who completed a thesis on a topic of interest. The following source provides information on University of Arizona Theses from 1946-1982: Checklist of Theses and Dissertations Accepted for Higher Degrees: University of Arizona. Arranged alphabetically by author under the department awarding the degree, information includes call number or microfiche number since 1982, author, title, degree year and pages. Theses are housed on the third floor of the Main Library and in CPNM--on microfiche beginning in 1982. Before 1982 one hard copy was kept in special collections and one hard copy in the stacks on the third floor of the Main Library. Beginning in 1982 all University of Arizona theses are kept in microform format only. An exception is made if the thesis topic is

related to Arizona interests. Then one hard copy is kept in Special Collections.

Central Reference Department (Main Library) maintains card files arranged by departments for 1983 and 1984 theses.

1983 and 1984:

Stages:
1. University Library receives thesis.
2. Card put in file--CRD.
3. Thesis sent to University Microfilms (six weeks).
4. Information sent to Catalog Department.
5. Microfiche copy sent to Microform Room.

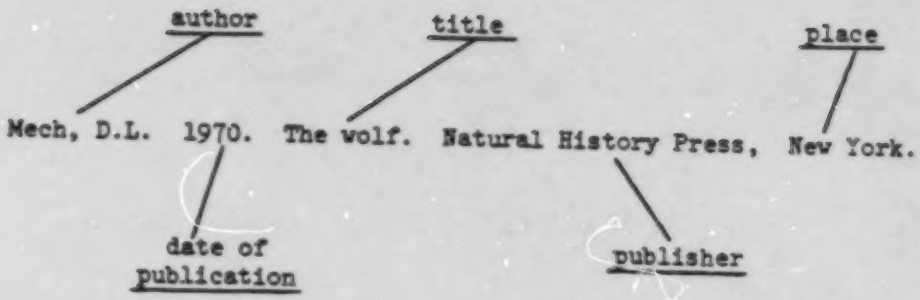
This last handout will serve you well. Following these suggested steps when doing research in the library will assist you in determining whether or not the item you are searching for is available. (Speaker goes over handout--Checklist for Known Item Searching.)

ASSIGNMENT HANDED OUT--"KNOWN ITEM SEARCHING"

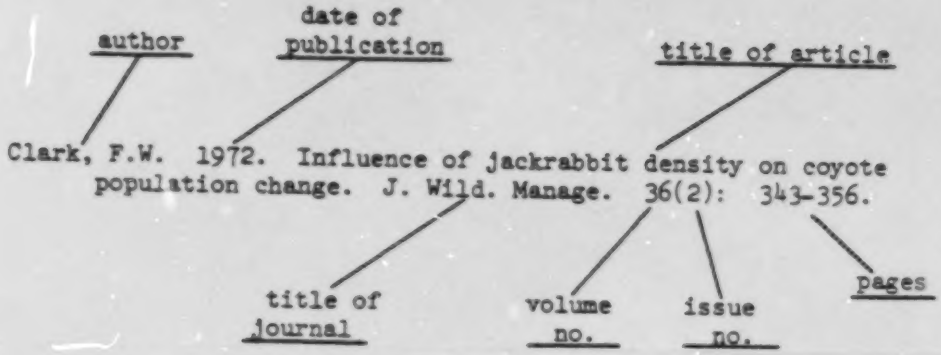
EXPLAIN FINAL ASSIGNMENT

TYPICAL CITATIONS

Book

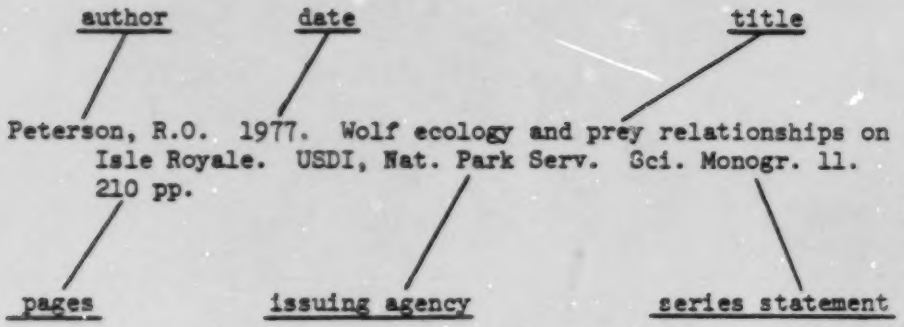


Journal

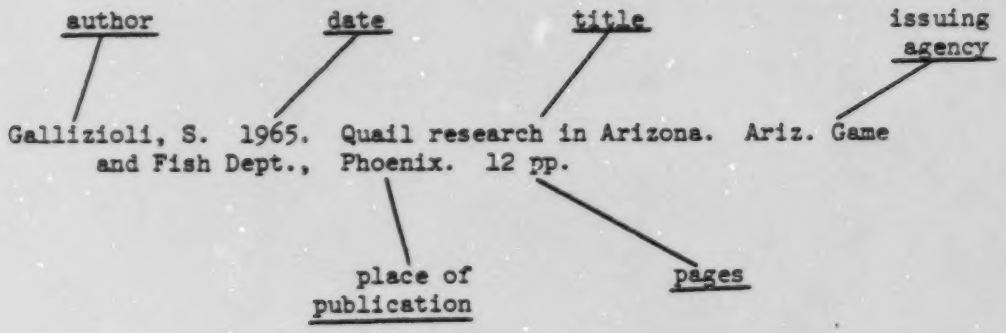


TYPICAL CITATIONS

Government Document--U.S.

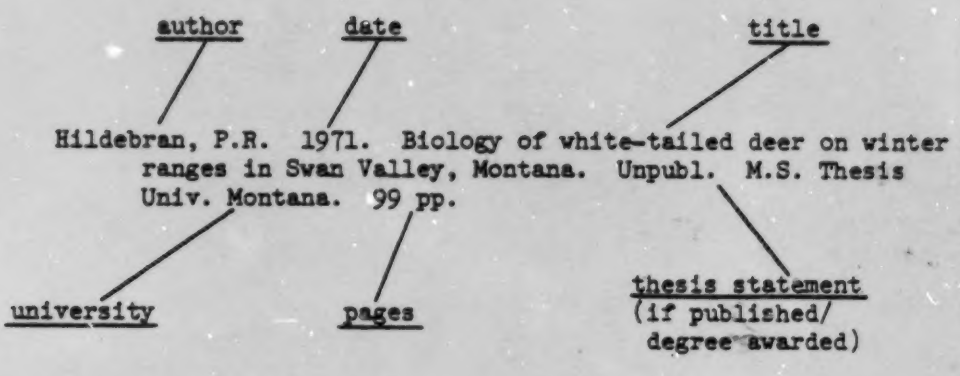

author
date
title
Peterson, R.O. 1977. Wolf ecology and prey relationships on Isle Royale. USDI, Nat. Park Serv. Sci. Monogr. 11. 210 pp.
pages
issuing agency
series statement

Government Document--State

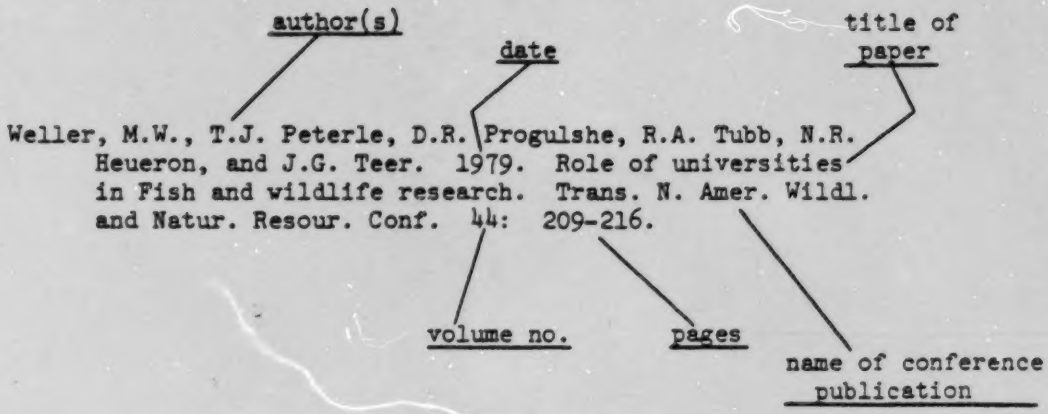


TYPICAL CITATIONS

Thesis


author
date
title
Hildebran, P.R. 1971. Biology of white-tailed deer on winter ranges in Swan Valley, Montana. Unpubl. M.S. Thesis Univ. Montana. 99 pp.
university
pages
thesis statement (if published/ degree awarded)

Conference Proceeding


author(s)
date
title of paper
Weller, M.W., T.J. Peterle, D.R. Progulshe, R.A. Tubb, N.R. Heueron, and J.G. Teer. 1979. Role of universities in Fish and wildlife research. Trans. N. Amer. Wildl. and Natur. Resour. Conf. 44: 209-216.
volume no.
pages
name of conference publication

ABBREVIATIONS UNRAVELED

1. PE 1693 A2 9th 1985-86 v. 1 A-K L-Z

   Acronyms, Initialisms, and Abbreviations Dictionary. Ed. by Ellen T. Crowley. 8th ed. Detroit, MI: Gale Research Co., 1983-1984.

2. S 1 B462 Science Ref.

   Agricultural Journal Titles and Abbreviations. 2nd ed. Phoenix: Oryx Press. 1983.

3. Z 5323 A525 1907-1979 Sci. Ref.

   Chemical Abstracts Service Source Index. 1907-1944 Cumulative. Columbus, OH: Chemical Abstracts Service, 1975.

4. R 100 I5135 Sci. Ref. Desk

   List of Journals Indexed in Index Medicus, 1984. Washington: U.S. Dept. of Health, Education and Welfare, Public Health Service.

5. Q 1 S68 Sci. Ref.

   SCI Science Citation Index 1982 Guide and List of Source Publications. Philadelphia, PA: Institute for Scientific Information. 1983.

6. QH 301 B688 1982 Sci. Ref.

   Serial Sources For the BIOSIS Data Base. v 1983. Philadelphia, PA: BioSciences Information Service. 1983.

NP ..... Nurse Practitioner
NP ..... Nursing Procedure
NP ..... Peters Aviation Ltd. [*Great Britain*] [*ICAO designator*]
NPB ..... Negative-Positive-Zero
NPA ..... Committee for a National Peace Academy [*Later, N-PAC*]
NPA ..... N-Propylamine [*Organic chemistry*]
NPA ..... Naphthylphthalamic Acid [*Organic chemistry*]
NPA ..... National Paddleball Association
NPA ..... National Panel of Arbitrators
NPA ..... National Paperboard Association [*Later, API*]
NPA ..... National Paragon Corp. [*American Stock Exchange symbol*] [*Delisted*]
NPA ..... National Paralegal Association
NPA ..... National Parking Association
NPA ..... National Parks Association [*Later, NPCA*]
NPA ..... National Particleboard Association
NPA ..... National Pasta Association [*Formerly, NMMAA*]
NPA ..... National Patrolmen's Association
NPA ..... National Peace Academy
NPA ..... National People's Action
NPA ..... National Perinatal Association
NPA ..... National Personnel Associates
NPA ..... National Pet Association [*Defunct*]
NPA ..... National Petroleum Association [*Later, NPRA*]
NPA ..... National Pharmaceutical Association
NPA ..... National Pigeon Association
NPA ..... National Pilots Association [*Defunct*]
NPA ..... National Pituitary Agency
NPA ..... National Planning Association
NPA ..... National Plastercraft Association
NPA ..... National Podiatry Association
NPA ..... National Police Agency [*Japan*]
NPA ..... National Ports Authority [*British*]
NPA ..... National Preservers Association [*Later, International Jelly and Preserve Association*]
NPA ..... National Priority Area [*Military*]
NPA ..... National Proctologic Association
NPA ..... National Production Authority [*Functions merged into BDSA, 1953*]
NPA ..... National Prohibition Act
NPA ..... National Psychological Association
NPA ..... Naval Procurement Account
NPA ..... Navy Postal Affairs Section Publication
NPA ..... Near Point Accommodation [*Ophthalmology*]
NPA ..... Neutrons per Absorption
NPA ..... New People's Army [*Communist guerrilla force*] [*Philippines*]
NPA ..... New Populist Action [*Defunct*]
NPA ..... Nigerian Ports Authority Clerical Workers' Union
NPA ..... Nine Pin Association
NPA ..... Normal Pressure Angle
NPA ..... Numbering Plan Area [*Bell System*]
NPA ..... Numerical Production Analysis
NPA ..... Pensacola, FL [*Location identifier*] [*FAA*]
NPAA ..... National Photographic Art Archive [*Victoria and Albert Museum*] [*British*]
NPAB ..... Navy Price Adjustment Board
N-PAC ..... National Peace Academy Campaign [*Formerly, NPA*]
NPAC ..... National Peace Action Coalition
NPAC ..... National Program for Acquisitions and Cataloging [*Library of Congress*]
NPAC ..... Navy Procurement Assignment Committee
NPACI ..... National Production Advisory Council on Industry [*British*]
NPACOE ..... National Panhellenic Association of Central Office Executives
NPACSE ..... National Political Action Committee for Scientists and Engineers
NPACT ..... National Public Affairs Center for Television [*Defunct*]
NPAED ..... National Progress Association for Economic Development
NPals ..... Palisades Free Library, Palisades, NY [*Library symbol*]
NPAM ..... Nonpermanent Active Militia
NPAMX ..... Naval Potomac Annex
NPAP ..... National Psychological Association for Psychoanalysis
NPAR ..... National Paragon Corp. [*NASDAQ symbol*]
NP/ARCA ..... National Pacific/Asian Resource Center on Aging
NPAS ..... Normalized Photoacoustic Signal [*Instrumentation*]
NPat ..... Patchogue Library, Patchogue, NY [*Library symbol*]
NPatB ..... Brookhaven Town Hall, Historical Collection, Patchogue, NY [*Library symbol*]
NPatBH ..... Brookhaven Memorial Hospital, Patchogue, NY [*Library symbol*]
NPB ..... NADGE [*NATO Air Defense Ground Environment*] Policy Board
NPB ..... National Parole Board [*Canada*]
NPB ..... National Plant Board
NPB ..... Nonprimate Biosatellite
NPB ..... Norfolk & Portsmouth Belt Line Railroad Co. [*AAR code*]
NPBA ..... National Palomino Breeders Association [*Inactive*]
NPBA ..... National Paper Box Association [*Formerly, NPBMA; later NP & PA*]
NPBA ..... National Pocket Billiards Association
NPBA ..... National Police Bloodhound Association
NPBA ..... National Poro Beautician Association
NPBA ..... Natural Product Broker Association
NPBC ..... National Penn Bancshares [*NASDAQ symbol*]
NPBC ..... National Progressive Broadcast Coalition
NPBE ..... National Political Button Exchange [*An association*] [*Defunct*]
NPBE ..... Nitrophenyl Butyl Ether [*Organic chemistry*]
NPBEA ..... National Poultry, Butter, and Egg Association [*Defunct*]
NPBI ..... National Pretzel Bakers Institute
NPBMA ..... National Paper Box Manufacturers Association [*Later, NPBA, NP & PA*]
NPBRO ..... Naval Plant Branch Representative Office
NPBSA ..... National Paper Box Supplies Association [*Defunct*]
NPC ..... NASA Procurement Circular
NPC ..... NASA Publication Control
NPC ..... Nasopharyngeal Carcinoma [*Medicine*]
NPC ..... National Panhellenic Conference
NPC ..... National Patent Council
NPC ..... National Peach Council
NPC ..... National Peanut Council
NPC ..... National People's Congress [*China*]
NPC ..... National People's Congress [*Political party*] [*Nigeria*]
NPC ..... National Periodicals Center
NPC ..... National Personnel Consultants
NPC ..... National Petrochemical Company [*Iran*]
NPC ..... National Petroleum Council [*Department of Energy*]
NPC ..... National Pharmaceutical Council
NPC ..... National Philatelic Collections [*Smithsonian Institution*]
NPC ..... National Playwrights Conference
NPC ..... National Plumbing Code
NPC ..... National Poetry Circle [*Cambridge*] [*British*]
NPC ..... National Ports Council [*British*]
NPC ..... National Potato Council
NPC ..... National Press Club
NPC ..... National Prime Contractor
NPC ..... National Productivity Council [*Inactive*]
NPC ..... National Publicity Council for Health and Welfare Services [*Later, NPRC*]
NPC ..... Native Preacher Company [*An association*]
NPC ..... NATO Parliamentarians' Conference
NPC ..... NATO Pipeline Committee
NPC ..... NATO Programing Center
NPC ..... Naval Photographic Center
NPC ..... Navy Policy Council
NPC ..... Navy Procurement Circular
NPC ..... Near Point of Convergence [*Ophthalmology*]
NPC ..... Needle Punch Card
NPC ..... Neuropsychiatry Clerical Procedure [*Navy*]
NPC ..... Neuropsychiatry Clerical Technician [*Navy*]
NPC ..... New Practice Cases [*Legal*] [*British*]
NPC ..... Ninety Pound Charge
NPC ..... No Previous Carrier [*Insurance*]
NPC ..... Nonprinting Character [*Data processing*]
NPC ..... North Pacific Coast Freight Bureau, Seattle WA [*STAC*]
NPC ..... Northern Peoples Congress [*Nigeria*]
NPC ..... Public Library of Charlotte and Mecklenburg County, Charlotte, NC [*OCLC symbol*]
NPCA ..... National Paint and Coatings Association
NPCA ..... National Parks and Conservation Association
NPCA ..... National Pest Control Association
NPCA ..... National Precast Concrete Association
NPCC ..... National Pop Can Collectors
NPCC ..... North Peralta Community College [*California*]
NPCC ..... Northeast Power Coordinating Council [*Regional power council*]
NPCF ..... National Pollution Control Foundation
NPCFB ..... North Pacific Coast Freight Bureau
NPCI ..... National Potato Chip Institute [*Later, PC/SFA*]
NP-CLT ..... Neuropsychiatry Clerical Procedure Technician [*Navy*]
NPCM ..... National Parks and Conservation Magazine [*A publication*]
NPCN ..... National Poison Center Network
NPCNU ..... Neopentyl(chloroethyl)nitrosourea [*Biochemistry*]
N-P, Complete ... Nondeterministic Polynomial Complete Problem [*Mathematics*]
NPCP ..... Nairobi Peoples' Convention Party
NPCP ..... National Prostatic Cancer Project
NPCR ..... No Periodic Calibration Required
NPCR ..... No Programed Calibration Required
NP-CT ..... Naval Personnel Conversion Tables
NPD ..... NASA Policy Directive
NPD ..... National Paint Distributors
NPD ..... National Patent Development Corp. [*American Stock Exchange symbol*]
NPD ..... National Power Demonstration
NPD ..... National Program for Dermatology
NPD ..... Nationaldemokratische Partei Deutschlands [*German National Democratic Party*] [*East Germany*]
NPD ..... Navy Procurement Directives
NPD ..... Niemann-Pick Disease [*Medicine*]
NPD ..... Night Perimeter Defense
NPD ..... Nitrogen, Phosphorus Gas Chromatographic Detector [*Spectroscopy*]
NPD ..... No Payroll Division
NP or D ..... No Place or Date

BEST COPY AVAILABLE

J Dairy Sci 44.8 J822
Journal of dairy science. (0022-0302) 0409

J Dev Physiol QP1.J63
Journal of developmental physiology. (0141-9846) 0006

J Econ Hist 277.8 J822
The Journal of economic history. (0022-0507) 0016

J Elisha Mitchell Sci Soc 500 EL4
The Journal of the Elisha Mitchell Scientific Society. (0013-6220) 0007

J Embryol Exp Morphol 442.8 J829
Journal of embryology and experimental morphology. (0022-0752) 0045

J Energy TJ163.2.J59
Journal of energy (0146-0412) 0005

J Entomol Res QL463.J4J6
Journal of entomological research. 0025

J Entomol Soc Aust 423.92 EN84
Journal of the Entomological Society of Australia. (0071-0725) 0011

J Entomol Soc B C 420 B77
Journal - Entomological Society of British Columbia. (0071-0733) 0012

J Environ Econ Manage HC79.P35J6
Journal of environmental economics and management. (0095-0696) 0024

J Environ Health 449.8 J824
Journal of environmental health. (0022-0892) 0014

J Environ Manage HC75.E5J6
Journal of environmental management. (0301-4797) 0022

J Environ Pathol Toxicol RB152.J6
Journal of environmental pathology and toxicology (0146-4779) 0014

J Environ Syst TD1.J67
Journal of environmental systems (0047-2433) 0001

J Equine Med Surg SF951.J6
The Journal of equine medicine and surgery. (0147-0833) 0034

J Evol Biochem Physiol QP1.J725
Journal of evolutionary biochemistry and physiology. (0022-0930) 0040

J Exp Biol 442.8 B77
The Journal of experimental biology. (0022-0949) 0026

J Exp Bot 480 J8234
Journal of experimental botany. (0022-0957) 0200

J Exp Mar Biol Ecol QH91.A1J6
Journal of experimental marine biology and ecology. (0022-0981) 0080

J Fac Fish Anim Husb Hir Univ 22.5 H6122
Journal - Faculty of Fisheries and Animal Husbandry, Hiroshima University. (0440-8756) 0024

J Fac Sci Univ Tokyo Sect IV Zool 513 T571C
Journal of the Faculty of Science, the University of Tokyo. Zoology. 0008

J Fac Text Sci Technol Shinshu Univ Ser A Biol Shinshu Daigaku Senigakubu 442.9 UY3
Journal of the Faculty of Textile Science and Technology. Biology. (0583-0648) 0001

J Ferment Technol QP601.A1J6
Journal of fermentation technology. (0385-6380) 0068

J Fire Flammability TH1092.J6
The Journal of fire & flammability. (0022-1104) 0002

J Fish Dis SH171.A1J68
Journal of fish diseases. (0140-7775) 0033

J Food Biochem TX348.J6
Journal of food biochemistry. (0145-8884) 0028

J Food Nutr (Canberra)
Journal of food & nutrition. 0033

J Food Process Eng TP368.J7
Journal of food process engineering. (0145-8876) 0017

J Food Process Preserv TX599.J6
Journal of food processing and preservation. (0149-6085) 0035

J Food Qual TP373.5.J6
Journal of food quality. (0146-9428) 0030

J Food Saf TP373.5.J62
Journal of food safety. (0149-6085) 0022

J Food Sci 389.8 F7322
Journal of food science. (0022-1147) 0610

J Food Sci Tech 389.8 J823
Journal of food science and technology. (0022-1155) 0040

J Food Serv Syst
Journal of food service systems. (0196-4283) 0007

J For Hist 99.8 F7698
Journal of forest history. (0094-5080) 0022

J For Suisse Schweiz Z Forstwes 99.8 J82
Journal forestier suisse. = Schweizerische Zeitschrift fur Forstwesen. (0036-7818) 0093

J Forensic Sci RA1001.J6
Journal of forensic sciences. (0022-1198) 0002

J Freshwater QH96.A1J6
The Journal of freshwater. 0005

J Gen Appl Microbiol 448.3 J824
The Journal of general and applied microbiology. (0022-1260) 0023

J Gen Physiol 447.8 J822
Journal of general physiology (0022-1295) 0006

J Gen Virol QR360.A1J6
The Journal of general virology. (0022-1317) 0130

J Graph Theory QA166.J6
Journal of graph theory. (0364-9024) 0001

J Helminthol 436.8 J82
Journal of helminthology. (0022-149X) 0027

J Histochem Cytochem 381 J8223
The Journal of histochemistry and cytochemistry. (0022-1554) 0006

J Hortic Sci 80 J825
The Journal of horticultural science (0022-1589) 0103

J Hospitality Educ
The Journal of hospitality education 0008

J Hum Nutr 389.8 N959
Journal of human nutrition. (0308-4329) 0122

J Hydrol 292.8 J82
Journal of hydrology. (0022-1694) 0036

J Hyg 449.8 J82
The Journal of hygiene. (0022-1724) 0052

J Hyg Epidemiol Microbiol Immunol 448.8 J826
Journal of hygiene, epidemiology, microbiology, and immunology. (0022-1732) 0012

J Immunogenet QR180.J62
Journal of immunogenetics (0305-1846) 0001

J Indian Chem Soc 385 IN27
Journal of the Indian Chemical Society. (0019-4522) 0041

J Indian Inst Sci 513 IN23
Journal - Indian Institute of Science. (0019-4964) 0001

J Indian Soc Agric Stat 22 IN292
Journal of the Indian Society of Agricultural Statistics. (0019-6363) 0016

J Indian Soc Soil Sci 56.9 IN2
Journal of the Indian Society of Soil Science. (0019-638X) 0109

J Inorg Biochem QD415.B5
Journal of inorganic biochemistry. (0162-0134) 0005

J Insect Physiol 421 J825
Journal of insect physiology. (0022-1910) 0169

J Inst Anim Tech QL55.I5
Journal - Institute of Animal Technicians. (0020-2711) 0008

J Inst Brew 390.9 IN7
Journal of the Institute of Brewing. (0046-9750) 0068

J Inst Wood Sci 99.82 IN7
Journal of the Institute of Wood Science. (0020-3203) 0015

J Iwate Daigaku Nogaku 107.6 IW93
Journal - Iwate Daigaku, Nogaku-bu. (0579-2746) 0017

J Kans Entomol Soc 420 K13
Journal of the Kansas Entomological Society. (0022-8567) 0117

J Lepid Soc 421 L554
Journal of the Lepidopterists' Society. (0024-0966) 0062

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Journal of Virology (Tokyo). See Ubirusu.

Journal of Viscosity. JVITAA. ISSN 0021-4396. In Eng; Eng sum. vl 2 10, 1968-vl8 n4 D, 1972.
JOURNAL OF VISCOSITY. KYOTO. Changed to *J. Nucr. Sci. Viscosimet.*, which see.

Journal of Vitaminology. See Bitamin.

Journal of The Vitamin Society of Japan. See Bitamin.

Journal of Volcanology and Geothermal Research. JVGRDQ. ISSN 0377-0273. In Eng; Eng sum. [Also accepts pap in Fr or Ger.] vl nl Ja, 1976+. *4/yr* [3r/yr] 4 n/Yr. *Elsevier (Amsterdam).*
JOURNAL OF VOLCANOLOGY AND GEOTHERMAL RESEARCH. AMSTERDAM.
Doc. Supplier: OATS.
AAP; AsTeS; CLU; CPT; CSt; CU-SB; CU; CU-A; CU-RivP; CU-S; CU-SC; CoG 1967+; FMU; FU; GAT; GU; HU; IAsr; IEN; IU; IaAS; IaU; IsU; KU; KyU; LU; MWH; MdBJ; MiU; MnU; MoKL; MoU 1979+; MoRM; N 1979+; NAIU; NBuSU; NIC; NN; NNC; NBuSU; NSyU; NTR; NhU; NhD; NvU; OAkU; OCIW; OCoS; OrU; OrCS; OrU-S; PSt; PU; RPB; ScCleU; ScU; TNJ; TxHR; TxDaM 1977+; TxHR; TxU; ULA; UPB 1978+; UU; ViBibV; WU-E; WaPS; WaSU; Bz; CaAEU; CaBVaU; CaNSHD; CaOKQ; CaOLU; CaOON; Uk; CoNT1B; *JTJ*; *JRTU* 1977+; SwSK
Journal of the Wakayama Medical Society. See Wakayama Igaku.

Journal of the Washington Academy of Sciences. JWASA3. ISSN 0043-0439
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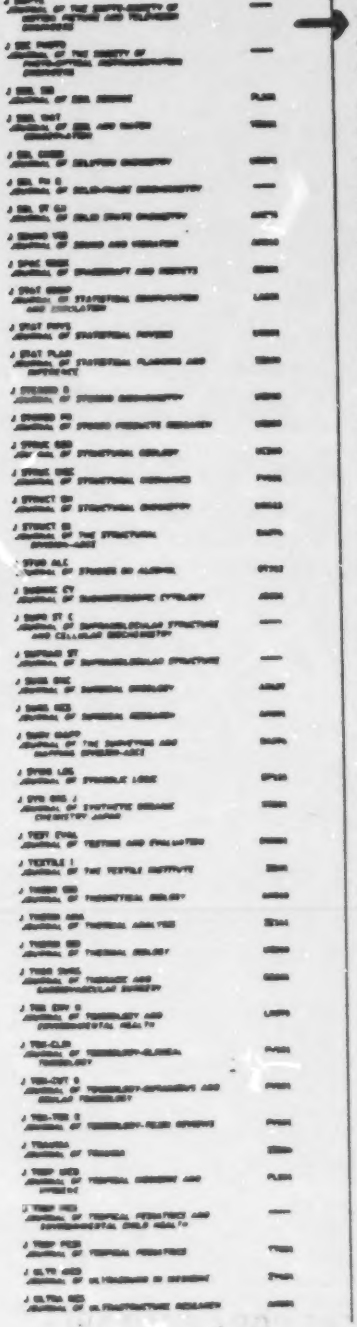

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WEST ern RESOURces CONFerence Ceased publication	WRECAF	A	1258
WEST ern SOCiety of MALACOLogists ANNUal REPort	ANMADW	A	6056
WEST ern WILDLANDS	WSWLA3	Q	3862
WEST-EUR opean STATPhoto on CLINical CHEMistry Absorbed by CLINICA CHIMICA ACTA	WESCA6	/	1800
WET enskappelijke BYDRAE'S van die P. U. (POTCHEFSTROOMSE UNIVersiteit) vir C. H. O. (CHRISTELIKE HOERE ONDERWYS) REEKS B NATUURWET enskappe	WBPHBQ	B	2096
WET enschappelijke MEDEDeling K. N. N. V. (Koninklijke NED: erlandse NATUURWET enschap VEReniging)	WMDNA9	F	3436
WHO/AT INF ormation SERVice	WHOSA8	F	3410
WHO (world health organization) CHRONicle	WHOCAT	BM	6094
WHO (world health organization) FOOD ADDIT ives SERies Ceased publication	WHFAAC	F	6094
WHO (world health organization) NEWSletter of WHT enschap PUBLIC HEALTH	WHPHDU	F	6094
WHO (world health organization) OFFSET PUBLication	WHOPSZ	BM	6094
WHO (world health organization) PESTICide RESIDUES SER: ies	WHPRA8	IO	6094
WIADomosci BOTaniczne	WIBOA7	Q	4404
WIADomosci EKOLogiczne Continues EKOLOGIA POLSKA SERIA B	WEKLAF	Q	4404
WIADomosci LEKarskie	WILEAR	BM	4406
WIADomosci PARAZYTOLogiczne	WIPAA2	BM	4404
WIENer KLINische WOCHENSCHRift	WIWOAO	W	5378
WIENer KLINische WOCHENSCHRift SUPPLementum	WKWSA2	F	5377
WIENer MED izinische WOCHENSCHRift	WIMWOA4	BW	0870
WIENer MED izinische WOCHENSCHRift SUPPLementum	WIMWSAG	F	0870
WIENer TIERAERZTLiche MONATSSCHRift	WTMOA3	M	2094
WIENer Zeitschrift fuer INNere MEDizin und IHRE GRENZGEBiete Superseded by ACTA MEDICA AUSTRIACA	WZMAJ	M	5881
WILDFOWL	WLDFA8	A	6064
WILDLife in AUST ralia	WALIAX	Q	6068
WILDLife DIGest	WIDIAX	F	6064
WILDLife MANAGE ment BULLetin (OTTAWA) SERies 1 Superseded by CANADIAN WILDLIFE SERVICE REPORT SERIES	WMBAAR	F	0987
WILDLife MANAGE ment BULLetin (OTTAWA) SERies 2 Superseded by CANADIAN WILDLIFE SERVICE REPORT SERIES	WMBBAU	IO	4753

1) No longer maintained due to renewed coverage ordered
2) No subscription currently held

Title	CODEN	Freq	Publ
WILDLife MANAGEMENT Supersedes by JOURNAL OF WILDLIFE MANAGEMENT	WLMOAV	F	6070
WILDLife - a REVIew from Zambia WILDLife SERVice	WLRVBS	A	4170
WILDLife SOCiety BULLetin	WLSBA6	Q	6070
WILDLIFE (LONDON) Continues ANIMALS (LONDON)	WLDLAT	M	6069
WILHELM ROUX' ARCHiv fuer ENTWICKLUNGSMECHanik der ORGAnismen Continues ARCHIV FUER ENTWICKLUNGSMECHANIK DER ORGANISMEN (WILHELM ROUX) Continued as WILHELM ROUX'S ARCHIVES OF DEVELOPMENTAL BIOLOGY	WREDAH	F	5377
WILHELM ROUX'S ARCHives of DEVelopmental BIOLogy Continues WILHELM ROUX' ARCHIV FUER ENTWICKLUNGSMECHANIK DER ORGANISMEN	WRABDT	BM	5377
WILLDENOWIA Supersedes MITTEILUNGEN AUS DEM BOTANISCHEN GARTEN UND MUSEUM BERLIN-DAHLEM	WLDNAJ	F	0821
WILLDENOWIA BEIHeft	WLDBA3	IO	0821
WILSON BULLetin	WILBAI	Q	6079
WIRTSCHAFTSDIENST zu FRAGEN und PROBLEMen	WIFPAF	IO	2451
WIRTSCHAFTSDIENSTE FUTTER	WIFUAB	3/YR	1583
WISconsin AGRICultural EXPeriment STAtion BULLetin Continued as WISCONSIN COLLEGE OF AGRICULTURAL AND LIFE SCIENCES RESEARCH DIVISION SCIENCE REPORT BULLETIN	WIJABAO	F	6081
WISconsin AGRICultural EXPeriment STAtion RESearch BULLetin Continued as WISCONSIN COLLEGE OF AGRICULTURAL AND LIFE SCIENCES RESEARCH DIVISION RESEARCH BULLETIN	WIJARAR		0004
WISconsin AGRICultural EXPeriment STAtion RESearch REPort Continued as WISCONSIN COLLEGE OF AGRICULTURAL AND LIFE SCIENCES RESEARCH DIVISION RESEARCH REPORT	WIJAPAL	F	6081
WISconsin COLLege of AGRICultural and LIFE SCIences RESearch BRAnch RESearch REPort Continues WISCONSIN AGRICULTURAL EXPERIMENT STATION RESEARCH REPORT	WIJRRAA	F	4649
WISconsin COLLege of AGRICultural and LIFE SCIences RESearch BRAnch SCIence REPort BULLetin Continues WISCONSIN AGRICULTURAL EXPERIMENT STATION BULLETIN Ceased publication	WIJALA9	F	6081
WISconsin CONSERVation BULLetin Continued as WISCONSIN NATURAL RESOURCES BULLETIN	WSCBA9	BM	6082
WISconsin CONSERVation DEPartment TECHnical BULLetin Continued as WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL BULLETIN	WCDBA4	F	6082
WISconsin DEPartment of NATural RESOURces TECHnical BULLetin Continues WISCONSIN CONSERVATION DEPARTMENT TECHNICAL BULLETIN	WDNTAD	F	6082
WISconsin GEOLogical and NATural HISTory SURVey BULLetin	WGNBAC	F	5870
1 WISconsin MEDical Journal	WMJOA7	M	6083
2 WISconsin NATural RESOURces BULLetin Continues WISCONSIN CONSERVATION BULLETIN	WNRBDI	BM	6082
WISSenschaftliche ARBeiten der FORSCHUNGSANSTalt für FORSTWIRTSCHaft in ZVOLEN Sein VEDecke PRACE VYSKUMNEHO USTAVU LESN: ého HOSPODárstva vo ZVOLENE	VPVLBZ	F	5987
WISSenschaft und FORTSCHRitt	WFOAP	M	0156
WISSenschaftliche BEIHefte zur GESellschaft DeuTSCHer NATURFORSCHer und ARZTE	WNHAA5	IO	5377
WISSenschaftliche TASCHENBuecher Centered on individual titles in the series	WTBCAQ	IO	0156
WISSenschaftliche Zeitschrift der FRIEDRICH-SCHILLER-UNIVersitaet JENA MATHEMATISCH-NATURWISSenschaftliche REIHE	WZFMA4	BM	5732

3) Cessation assumed, all efforts to contact publisher have failed

BEST COPY AVAILABLE

SERIALS PROBLEMS
OR
THE NATURE OF THE BEAST

Many problems arise simply from--

A. The nature of bibliographic citations.

1. Abbreviated or truncated journal titles.
   Example: Fish. Manage.
   Fish. Res.

2. Incomplete citations.
   Failing to cite volume number, issue number, date.
   Citing commonly used journal titles without the place of publication.
   Example: Fisheries Bulletin (South Africa)
   Fishery Bulletin (Washington, National Marine Fisheries Service)

3. Reversal of the normal order of volume number, followed by issue number.

4. Spelling out in full the title of a journal or organization when the official form of the title is an acronym.
   Example: International Union for Conservation of Nature and Natural Resources instead of IUCN Bulletin.

B. The nature of serials publishing.

1. Title changes.
   Example: Land and Water--formerly Land and Water Development and Land and Water Contracting.
   African Wildlife News--formerly Wildlife News.

2. Mergers.

3. Short life spans and cessations.
   Example: These journals ceased publication in 1983--
   Outdoor Careers, Outdoor Guide, Outdoorsman.

4. Cessations of publications which resume some years later.

5. Name change of issuing agency.

6. Publication taken over by another organization.

7. Changes in frequency of publication.

8. Numbering problems:

   a. Changes in the way the volumes are numbered.

   b. New numbering every year.
      Example: Confusion arises when an issue is cited as "no. 1, 1984"; rather than "1984: no. 1"; The reader may think that the journal began publication in 1984.

   c. Special issues outside the regular series.

   d. Issues published out of numerical sequence.

   e. Misnumbered issues.

C. The nature of library cataloging and catalogs.

1. Changes in cataloging rules.
   Example: Soil Association, Quarterly Review
   Quarterly Review (Soil Association)

2. Inadequate number of cross references for title changes.

3. Subseries of regularly published journals.

(Adapted from a handout of University of California at Berkeley.)

(2)

HOW TO FIND JOURNALS

IN THE SCIENCE-ENGINEERING LIBRARY (SEL)

In the Science-Engineering Library (SEL) the basic sources available for locating journals are given below. In each case the journals included are listed or arranged alphabetically by:

1. title,
   or
2. corporate or organizational name.

I. JOURNALS LOCATED IN THE SEL

STEP I: FINDING CALL NUMBERS FOR JOURNALS IN THE SEL

A. SEL SERIALS FILE (Reference Room, near Reference Desk)
This card file contains the titles, call numbers, and holdings records of journals found in the SEL. Cards filed behind the journal title card show the SEL's holdings that are bound. The SEL has those volume numbers (preprinted in columns) that are checked, dated, or marked with a vertical line. Holdings that are indicated as being on microfilm are on a separate card and have a microfilm number rather than a call number. If this year's volumes are not checked in, the issues are still unbound. (See STEP 2 for locating bound and unbound journals and microfilm.)

TD
224
U8
A3 v. 1-100

Water resources bulletin

Salt Lake City, Utah.

Library Has Those That Are Checked card 3

1	11	21 ✓	31	41	51	61	71	81	91
2	12	22 ✓	32	42	52	62	72	82	92
3	13	23 ✓	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	00

Bound Volumes

Micro-film 6443	Water engineering & management.						
	Library Has Those That Are Checked						card 3
1981✓	1991	2001	2011	2021	2031	2041	2051
1982✓	1992	2002	2012	2022	2032	2042	2052
1983✓	1993	2003	2013	2023	2033	2043	2053
1984	1994	2004	2014	2024	2034	2044	2054
1985	1995	2005	2015	2025	2035	2045	2055
1986	1996	2006	2016	2026	2036	2046	2056
1987	1997	2007	2017	2027	2037	2047	2057
1988	1998	2008	2018	2028	2038	2048	2058
1989	1999	2009	2019	2029	2039	2049	2059
1990	2000	2010	2020	2030	2040	2050	2060

Microfilm Holdings

B. SEL CARD CATALOG (Lobby Area)
As with books, magazines and other journals are cataloged and thus are accessible through the Author-Title Card Catalog in the SEL. However, the most expeditious, and often necessary, means of retrieving scientific journals is to use the SEL Serials File, which is easier to use than the Card Catalog and also provides the holdings information.

TD
224 Water-resources bulletin. no. 1-
U8 1962- Salt Lake City, Utah
A3 Geological and Mineral Survey, 1962-

v. ill., maps 28 cm.
Each number has also a distincitve title.
Name of issuing body varies: no.1-17, 1962-73, Utah Geological and Mineralogical Survey; no. 18- 1973- Utah Geological and Mineral Survey.
Some issues prepared in cooperation with the United States Geological Survey.
ISSN 0502-8396

AzU 11 DEC 80 1624040 AZZDme SEE NEXT CRD

Catalog Card

(2)

STEP 2: LOCATING JOURNALS IN THE SEL BUILDING

Once you have found the call number for a journal title, you need to determine whether the issue or volume you want is bound, unbound (current), or on microfilm. Once you have determined this, then check the following:

Bound volumes: These are shelved with the books. Use the Call Number Location Guides to find building locations for specific call numbers. (e.g., Q-QB ... 1 NORTH)

Unbound issues: Current issues, not yet bound, and not yet checked in on the Serials File Holdings card, will be found in the Current Periodicals and Microforms Room, south wing of the main floor. Journal issues are shelved there by call number.

Microfilm: Microfilm copies of journals are kept in the Current Periodicals and Microforms Room, south wing of the main (2nd) floor. Microfilmed journals are in the cabinets on the right as you enter.

STEP 3: SEL JOURNAL ISSUES OR VOLUMES NOT ON THE SHELVES

UNBOUND ISSUES (CURRENT PERIODICALS AND MICROFORMS ROOM): Issues must be used in the Room, but are sometimes checked out for photocopying. If the issue you need is not on the shelf, ask at the Information Desk and staff will see if the journal has been checked in, checked-out to Photocopy, or is at the Bindery.

BOUND VOLUMES that are not on the shelf in their proper call number location, may be misshelved, in use, or in the process of being reshelved by the Loan Department staff. When looking for a volume:

1. Check the shelves adjacent to the volume's proper location.
2. Check tables, desks, and book-trucks in that wing of the building.
3. Check the Reshelving Areas, located by the entrance to the floor. Books and bound journals are shelved here in general call number order before they are reshelved in the stacks.
4. Check the Photocopy service areas.
5. If you still can't find the volume, check the next day. If it is still not there, you can request that a "search" be made for the item. "Searches" should be requested at the Loan Desk.

II. JOURNALS NOT LOCATED IN THE SEL

Many articles on scientific subjects are published in journals that are not devoted exclusively to science. Such journals are likely to be found in either the Main Library or the Arizona Health Sciences Center Library. Medical and pharmaceutical journals are located in the AHSC Library which is in the University hospital.

Use the following lists when you do not find the title you need in the SEL Serials File or the SEL Card Catalog.

A. UA Union List of Serials (Microfiche format, Reference Room)
Both Main and SEL periodicals are listed here, in one alphabet. Summary holdings are indicated as well as building locations.

B. Serial Holdings in the Arizona Health Sciences Center Library
Check this publication (attached to the clipboard found on the SEL Serials File table) for titles of biomedical, pharmacy, and health related journals that are not listed in the SEL Serials File. For each entry, the record of holdings is given alongside the code 'AZUM.'

The AHSC Library is located on North Campbell, 2 blocks north of Speedway. The Library is in the main hospital building, on the 3rd floor, Room 3404.

III. JOURNALS NOT OWNED BY OR MISSING FROM THE SEL

Interlibrary Loan service is available to University of Arizona students, faculty and staff who desire photocopies of articles from journals that are not held by or which have been declared missing by the U of A Library. See the librarian at the Reference Desk for an Interlibrary Loan Request Form and for futher information.

CHECKLIST FOR KNOWN ITEM SEARCHING

1. Look at the entire citation.

2. Interpret the parts of the citation.

3. Unravel abbreviations, especially those used for periodicals and conferences:
   Consult handout: Abbreviations Unraveled.

4. Determine if the University of Arizona owns the item(s).
   A. For Books: Consult the card catalog, ask librarians.

   B. For Journal Articles: Consult Serials File or U of A List of Serials. Check holdings information.
   Consult handout: How to Find Journals in the Science-Engineering Library.
   Consult handout: Serials Problems or The Nature of the Beast.

   C. For Conferences: Consult the card catalog. Look under editor/author, name of conference, or sponsoring agency.
   Consult:

   Z 7409 D56 Sci Ref — Directory of Published Proceedings. Series SEMT--Science/Engineering/Medicine/Technology. v.1-. White Plains, NY: Interdok Corp. 1965.

   Q 158.5 I52 — Index to Scientific and Technical Prodeedings. v.1-. Phila, PA: Institute For Scientific Information Inc., 1978-.

   D. For Theses or Dissertations: Consult card catalog under author's name. For U of A theses and dissertations consult:

   1946-1982:

   AS 36 A6 C5 year Sci Ref — Checklist of Theses and Dissertations Accepted For Higher Degrees, University or Arizona.

1983 and 1984:

Check card file maintained in Central Reference Department (Main Library).

5. STOP! STOP! STOP! STOP! STOP! STOP! STOP!

Do you need to verify your citations?

6. If the item(s) are owned by the University of Arizona:
   A. Check GEAC by call number.

   B. Check the appropriate shelves. If item is not on the shelf:
      -Check adjacent shelves
      -Check tables, desks, booktrucks in the area
      -Check near photocopy machines
      -Check back the next day. If item is still missing, request a "search" be made for the item at the loan desk.

7. If the item(s) are not owned by the University of Arizona:
   A. Check Interlibrary Loan Services.

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ASSIGNMENT THREE:

KNOWN ITEM SEARCHING

1. Please determine if the University of Arizona Library has the item checked on your bibliography.

2. Please list the steps you took to reach this conclusion.

3. If your answer is yes, you must include a photocopy of the first page of the article, document, etc.

For assistance consult "Checklist for Known Item Searching," or consult with a reference librarian.

GUIDELINES FOR THE FINAL ASSIGNMENT IN THE LIBRARY RESEARCH STUDY UNIT

The protection and management of fish and wildlife populations are ultimately dependent on the quality of our knowledge of the species involved, the environment and their interaction. In your professional work, you may often be asked to develop a summary of information on a part of the life history of a certain species. For the final assignment in the Library Research Study Unit, imagine that a supervisor has asked you for such a summary. You may choose the subject of your summary by selecting one species and one life history trait from the list provided (e.g., Beaver-Diet). In the introduction to your paper, explain why the type of information you are seeking is important to biologists and managers. The body of the paper should summarize relatively recent and significant findings, and a brief concluding paragraph might offer management recommendations, future research needs, a cautionary or warning statement about current practices or conditions or a general forcast of future conditions or needs.

This final assignment in the Library Research Study Unit will tap your skills at using a variety of library resources and services. You will utilize the skills needed to find sufficient information on your specific topic and to write a brief, but coherent summary statement on that topic. You are to use indexing and abstracting services to narrow your subject (if necessary), to select literature for closer examination, or to find related information.

The preceding library units outlined the value of and ways to find sources such as conference literature, scholarly journals, statistics and

(2)

government documents. Your research, through use of key articles, footnotes, bibliographies, and reference tools, should lead you to a variety of these sources. In order to properly reach and support your conclusions (management recommendations, future research needs, a cautionary or warning statement about current practices or conditions, etc.) you will need evidence from a wide range of sources. In your research you should examine at least:

-two scholarly/scientific journal articles

-two government publications

-one conference/symposium/meeting.

You will probably want to use other sources in addition to these when appropriate. The sources you select should be cited in the text of your paper, as well as in a final "References" section, according to the style required by the Journal of Wildlife Management. (Example attached)

The attached sheet includes steps you should take to document the sources you have cited or examined. Please include documentation for at least two government documents, two scholarly/scientific journal articles and one conference/symposium/meeting. If you examined or used any other sources please describe those in a similar fashion below.

SPECIES	LIFE HISTORY INFORMATION
Didelphis virginiana Opossum	Diet/Foods/Feeding
Lepus alleni Antelope jack rabbit	Reproduction
Sylvilagus audubonii Desert cottontail	Movement/Migration
Castor canadensis Beaver	Territories/Home Range
Canis latrans Coyote	Habitat Requirement
Vulpes vulpes Red fox	Mortality Factors
Vulpes macrotis Kit fox	Diseases
Ursus americanus Black bear	Taxonomy
Lynx rufus Bobcat	Population Regulation Mechanisms
Felis concolor Mountain lion	Distribution
Cervus elaphus Elk	Special Management Needs
Odocoileus hemionus Mule deer	
Odocoileus virginianus White-tailed deer	
Alces alces Moose	
Ovis canadensis Desert Bighorn sheep	
Haliaeetos leucocephalus Bald Eagle	
Meleagris gallopavo Wild Turkey	
Bonasa umbellus Ruffed Grouse	
Micropterus dolomieui Smallmouth Bass	
Lepomis macochirus Bluegill Sunfish	
Pomoxis nigromaculatus Black Crappie	
Salmo apache Arizona trout	
Salmo gilai Gila trout	
Xyrauchen texanus Razorback Sucker	
Cyprinodin macularius Desert Pupfish	

RESEARCH DOCUMENTATION--SOURCES CITED

Scholarly/Scientific Journals

-Please give author, and title of article.
-How or where did you find the journal article cited?
-If from an index, please give title, volume, and page. Under what subject heading did you look?
-If from the bibliography, footnote, etc. of a key source, (from a book, a thesis, a journal article, etc.) please give full citation of the key source.

Government Documents

-Please give title and author of the document.
-How or where did you find the document cited?
-If from an index, please give title, volume, and page. Under what subject heading did you look?
-If from the bibliography, footnote, etc. of a key source, (from a book, a thesis, a journal article, etc.) please give full citation of the key source.

Conference Proceedings

-Please give author/editor and name of conference publication.
-How or where did you find the conference proceedings cited?
-If from an index, please give title, volume, and page. Under what subject heading did you look?
-If from the bibliography, footnote, etc. of a key source, (from a book, a thesis, a journal article, etc.) please give full citation of the key source.

Other Sources

-Please use guidelines above.

RESEARCH DOCUMENTATION--SOURCES EXAMINED, BUT NOT USED

Scholarly/Scientific Journals

-Please give author, and title of article.
-How or where did you find the journal article cited?
-If from an index, please give title, volume, and page.
Under what subject heading did you look?
-If from the bibliography, footnote, etc. of a key source,
(from a book, a thesis, a journal article, etc.) please
give full citation of the key source.

Government Documents

-Please give title and author of the document.
-How or where did you find the document cited?
-If from an index, please give title, volume, and page.
Under what subject heading did you look?
-If from the bibliography, footnote, etc. of a key source,
(from a book, a thesis, a journal article, etc.) please
give full citation of the key source.

Conference Proceedings

-Please give author/editor and name of conference publication.
-How or where did you find the conference proceedings cited?
-If from an index, please give title, volume, and page.
Under what subject heading did you look?
-If from the bibliography, footnote, etc. of a key source,
(from a book, a thesis, a journal article, etc.) please
give full citation of the key source.

Other Sources

-Please use guidelines above.

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APPENDIX C:
Performance Exam

A performance exam was developed to help validate the objective test instrument. The test was developed by two members of the Library Instruction Advisory Committee and two grant project members. Thirteen performance test questions were designed to validate corresponding objective test questions. Test items to be validated were selected by the skill or learning outcome which they measured. Also included was an unstructured "search" where students were asked to compile a bibliography on a selected topic consisting of eight citations, including four different types of materials. Each test sheet provides the question, a space for student answer, and a space to record the time it took to complete the question. Accompanying proctor sheets duplicate each test question, and provide direction for proctors to ask students specific questions about how they went about answering a performance test question. In some cases this was very necessary to determine if students understood the concept being tested, or to determine steps they took to answer the question. The proctor sheet also includes the steps a student must take to perform the task correctly.

Students were chosen by random sample from the pool of students who have taken the Library Research Proficiency Exam (533 at the time of the sample).

The results of the performance exam were compared to the objective test and were analyzed with the help of a faculty member from the University of Arizona Graduate Library School. We were able to identify a high, medium, or low correlation between a student's performance on the objective test and on the performance exam. However, several factors prevented us from using the results to significantly validate the test instrument. Although over 2,000 students have now taken the objective test, at the time we did this study it had been administered to only 533 students. We believed these students represented the more highly motivated on campus because most departments had not yet begun requiring that students take it in order to graduate. Another factor was the time lag between when students took the objective test and when we gave them the performance exam. Many students in our sample had taken the objective test several months earlier, and therefore could have acquired certain library skills during the interim period. Also, we were not completely satisfied with certain performance exam items.

While no conclusions can be drawn from this study, it was helpful in many ways. We have a clear idea of what we now must do to validate the objective exam. This pilot study helped show us how to procede. We have a much clearer understanding of the time and administrative efforts which must be committed to such a study. Grant team members believe that it is too ambitious a project to do concurrently with other special programs.

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 1

Below is the call number of a book owned by the University of Arizona Library:

N
5310
P5
1982

1. On what floor is this book located? _____

2. Go to the appropriate floor and find this book. Bring it and one other book on the same topic back to the librarian administering this test.

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 2

Below is a citation to an item owned by the University of Arizona Library:

Fielding, Henry. Complete Works.

What is the call number for this item? _____

On what floor is it located? _____

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 3

You are looking for information on ____medical schools____. Identify the title and call number of a book on this subject owned by the University of Arizona Library.

Title _____

Call Number _____

_____

_____

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 4

Using the LCSH determine the appropriate subject heading for fatalism.
Identify the title and call number of a book on this subject owned by the University of Arizona Library.

Title_____

Call Number _____

_____

_____

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 5

You are looking for information on Arthur Miller's play "Death of a Salesman."_____.
Identify a book owned by the U of A Library about this play by Miller_____.
Note the title and the call number.

Title_____

Call Number_____

_____

_____

NAME:_____ TIME START:_____

DATE:_____ FINISH:_____

QUESTION 6

Below are four separate citations. Using the citation which has been circled by the proctor answer the following questions:

Does the U of A Library own this item? If the Library does own this item, what is it's call number?

(1.) Engine trouble; use of Chevrolet engines in Oldsmobiles. Time 109:66 My 9 '77.

YES____ NO____ If YES, call number: _____
_____
_____

2. On innovation and progress in the social sciences. P. Fletcher. bibl Social Science History 2:46-53 Spring '72.

YES____ NO____ If YES, call number: _____
_____
_____

3. Reading statistics of adult illiterates. G. Malicky and C.A. Norman. Reading World 1:67-74 Ja '61.

YES____ NO____ IF YES, call number: _____
_____
_____

4. Where law and order start:the genesis of boundaries and norms. R.A. Hodgkin. bibl Law and Human Behavior 3:260-74 Fall '79.

YES____ NO____ If YES, call number: _____
_____
_____

NAME:_____ TIME START_____

DATE:_____ FINISH_____

QUESTION 7

Where would go to find a list of recent journal articles on illiteracy. _____?

_____

Choose one citation from this list and write the title of the journal here.

_____

NAME:_____ TIME START_____

DATE:_____ FINISH_____

QUESTION 8

You need to find some scholarly literary criticism published between 1980-83 of Bernard Malamud's novel The Natural. Your professor has suggested that you use an Index to find articles in literary Journals. Which Index would you use?

_____

QUESTION 9

You are writing a paper in your English class on the author Joyce Carol Oates; you need biographical and critical material, so you start your search by using ESSAY AND GENERAL LITERATURE INDEX where you find this reference:

Oates, Joyce Carol

About

Smith, N. The terrified women of Joyce Carol Oates. In Allen, M. The necessary blankness p133-59.

Does the library own this? What is the call number?

Please list each step:

Where did you look?_____

What did you look under?_____

If you did not find the item, where did you look next?_____

_____

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 10

For one of your education courses you must give a 15 minute speech on the success of compensatory education in the pre-school years. You know that Project Head Start is the major example of such a program, but you do not know anything more about the topic. You decide to find an overview of the topic before you start looking for books and journal articles. Where would you look to find such an overview?

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 11

For your journalism class you need to write an article about the winning team in the Rose Bowl. Since you aren't a football fan you don't know anything about the details.

How would you go about finding this information for the 1984 Rose Bowl?

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 12

List three topics for which Government Documents would provide useful information.

List three topics for which Government Documents would not provide useful information.

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 13

For each of the following topics listed below, determine whether statistics would provide useful support for the thesis statement. If your answer is yes, note what sorts of statistics would be required, and explain briefly how they might be used to support the topic.

EXAMPLE:

Thesis: The Japanese whaling industry has played a major role in the threatened extinction of the blue whale.

Needs statistical support? _X_ yes ___ no

If yes, what sorts of statistics would be required and how would they be used?

Statistics on the number of blue whales now alive compared with 50-100 years ago. Statistics on the number of blue whales killed annually by the Japanese fishing fleets. Demonstrate a direct correspondence between the rise of the Japanese fishing industry and decline of the blue whale population.

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 13

Thesis: Nuclear power plants are safe and economical producers of energy.

Needs statistical support? _____yes _____no
If yes, why and how?

_____

_____

_____

_____

_____

_____

NAME:_____

DATE:_____

TIME
START_____

FINISH_____

QUESTION 14

You are writing a paper on _____.

Using any resources available in the Main Library, compile a bibliography consisting of eight citations including four different kinds of materials. Different kinds of materials include such items as books, journal articles, maps, government documents, media, statistical sources, encyclopedias, newspapers, dissertations, technical reports, handbooks, etc.

As you conduct your search for relevant materials list any sources that you use and indicate whether or not they were helpful. In other words, document the steps in your search strategy.

You may not consult the reference librarians for this assignment. If you have any questions ask the proctor administering this task. You have _____ minutes to complete this task.

CITATION:	SOURCE:
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 1 DATE:_____ FINISH_____

Below is the call number of a book owned by the University of Arizona Library:

N
5310
P5
1982

1. On what floor is this book located? _____

2. Go to the appropriate floor and find this book. Bring it and one other book on the same topic back to the librarian administering this test.

Elapsed Time:_____

A. Did the student find the book? Yes____ No____

B. Did the student find a second book on the same subject? Yes____ No____

C. How did you determine what floor the book was on? Bookstack Guide____
Knew in advance____
other____

D. Did you have difficulty locating the book in the stacks?
Yes____ No____
If yes, why? _____

E. How did you locate another book on the same subject as the original book?
Subject classification____ Subject Card Catalog____
Noticing nearby books ____ other____

F. How did you know it was on the same subject? Call number____
Other_____

Student must:

A. Decide whether the call number is Dewey or LC.
B. Locate the bookstack guide, either in CRD or elsewhere.
C. Use the bookstack guide to determine the floor on which the book is located.
D. Find the book in the stacks, using their knowledge of call number order.
E. Locate another book on the same subject, either by:
   1. Knowing in advance that classification is based on subject, and that similar books will be near the original call number.
   2. Finding the original book, discovering its subject, and noticing that similar books are nearby.
   3. Returning to the reference room and looking in the Subject Catalog for another book on the same subject as the original book.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 2

DATE:_____ FINISH_____

Below is a citation to an item owned by the University of Arizona Library:

Fielding, Henry. Complete Works.

What is the call number for this item? _____

On what floor is it located? _____

Elapsed Time:_____

A. Where did you look to find the call number for this item?

Author/Title Catalog=Author_____ Other_____
Author/Title Catalog=Title_____

B. Did you think the citation was to a journal? Yes____ No____

**Ask question "B" only if student answers anything other than Author/Title Catalog=Author.

Student must:

A. Recognize that the item in the citation is a book, rather than a serial.
B. Know that, given an author and a title, the easiest way to find its call number is by looking in the author/title catalog.
C. Look in the author/title catalog under the appropriate term (in this case "Fielding, Henry," since there will be quite a few cards for "Complete Works"). May look under "Complete Works", it would be correct.
D. Recognize the call number on the card catalog.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 3

DATE: _____ FINISH_____

You are looking for information on medical schools. Identify the title and call number of a book on this subject owned by the University of Arizona Library.

Title _____

Call Number _____

_____

_____

Elapsed Time:_____

A. What steps did you take to identify the title and call number of a book on this topic?

LCSH to Subject Card Catalog_____
Subject Card Catalog only_____
Other_____

Students will be given a topic (natural language subject heading) and will use the LC Subject Headings and the subject card catalog to find a book on the subject owned by the U of A. Students will bring us the title and call number of this item. Q17

Student should go to LCSH and find the established subject heading for this topic.

Student should then go to the subject card catalog and look under the appropriate subject heading.

Student should note the title and call number of the book he/she selected on the topic.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 4 DATE:_____ FINISH_____

Using the LCSH determine the appropriate subject heading for fatalism.
Identify the title and call number of a book on this subject owned by the University of Arizona Library.

Title_____

Call Number _____

_____

_____

Elapsed Time:_____

A. How did you determine the correct subject heading?

LCSH to Subject Card Catalog_____
Subject Card Catalog only_____

B. What steps did you take to identify the title and call number of a book on this topic?

Subject Card Catalog_____
Other_____

Student should find appropriate cards in the subject card catalog and note both the title and call number of the book he/she selected on the topic.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 5

DATE:_____ FINISH_____

You are looking for information on Arthur Miller's play Death of a Salesman.

Identify a book owned by the U of A Library about this play by Miller .
Note the title and the call number.

Title_____

Call Number_____

_____

_____

Elapsed Time:_____

A. How did you find your title? _____

_____

B. What steps did you take to identify the title and call number of a book on this topic?

_____ Subject Card Catalog under: Author, Title.

_____ Subject Card Catalog under: Title.

_____ Author/Title Catalog under: Author.

_____ Other

Students will be given a play as a subject. Students will use the subject card catalog to find a book owned by the U of A Library on this subject. Students will note the title and call number of this book. Q7

Student should go to the subject card catalog and look under the subject Miller, Arthur - Death of a Salesman.

Student should note the title and call number of the appropriate book.

PROCTOR SHEET NAME:_____ TIME START_____

QUESTION 6 DATE:_____ FINISH_____

Below are four separate citations. Using the citation which has been circled by the proctor answer the following questions:

Does the U of A Library own this item? If the Library does own this item, what is it's call number?

(1.) Engine trouble; use of Chevrolet engines in Oldsmobiles. Time 109:66 My 9 '77.

YES___ NO___ If YES, call number: _____

2. On innovation and progress in the social sciences. P. Fletcher. bibl Social Science History 2:46-53 Spring '72.

YES___ NO___ If YES, call number: _____

3. Reading statistics of adult illiterates. G. Mallcky and C.A. Norman. Reading World 1:67-74 Ja '6..

YES___ NO___ IF YES, call number: _____

4. Where law and order start:the genesis of boundaries and norms. R.A. Hodgkin. bibl Law and Human Behavior 3:250-74 Fall '79.

YES___ NO___ If YES, call number: _____

Elapsed Time:_____

A. What is this a citation to? _____ B. How did you know?_____

C. Where did you look to determine whether or not the library owns this item?

Serials List_____ Other_____

If other, ask: Did you think this was a citation to a book? Yes____ No____

D. Since we do not own the year for #2 or #3, if the student brings a call number for this question ask: Did you determine that we own this particular volume or year?

Yes_____ No_____

Student must:

A. Recognize that the items are journal articles rather than books.
B. Know that to determine periodical holdings the U of A Serials List must be used.
C. Know the title of the journal is the element to be looked up on the Serials List — i.e. use the Serials List correctly.
D. Interpret the call number and holdings information on the Serials List.

PROCTOR SHEET

NAME:_____ TIME START_____

DATE:_____ FINISH_____

QUESTION 7

Where would go to find a list of recent journal articles on _____? illiteracy

_____

Choose one citation from this list and write the title of the journal here.

_____

Elapsed Time:_____

A. Did the student use a periodical index? Yes____ No____

B. If not, why? _____

_____

Note: "gun control laws" is a natural language term and the heading used by many indexes is "Firearms--Law and legislation."

: student could conceivable find a bibliography on the topic instead of using a periodical index.

: the student could use an index such as P.A.I.S., which includes more than just journal articles. If the student chooses a citation which is not to an article ask question C.

C. Did you think this was a citation to a journal article? Yes____ No____

Student must:

A. Know that periodical indexes are the correct tools to use to locate journal articles by subject.
B. Choose an appropriate index.
C. Use the index correctly by locating the proper subject heading.
D. Recognize and copy down a complete citation to a journal article.
E. Students must understand a "see" reference if encountered.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 8

DATE:_____ FINISH_____

You need to find some scholarly literary criticism published between 1980-83 of Bernard Malamud's novel The Natural. Your professor has suggested that you use an index to find articles in literary journals. Which index would you use?

_____

Elapsed Time:_____

A. How did you select this index?

_____ I knew it from English class.

_____ I looked on the index table for literature and selected this one.

_____ I looked in the card catalog.

_____ I looked in Shaehy (or other bibliography).

_____ I looked in the Library Skills Workbook.

_____ Other

B. Did you know the name of the index in literature? Yes____ No____

C. How would you find an index in a field if you did not know the major index?

_____

_____

_____

Student must:

A. Recognize what in index is.

B. Select an appropriate index.

PROCTOR SHEET

NAME:_____ TIME START_____

QUESTION 9 DATE:_____ FINISH_____

You are writing a paper in your English class on the author Joyce Carol Oates; you need biographical and critical material, so you start your search by using ESSAY AND GENERAL LITERATURE INDEX where you find this reference:

Oates, Joyce Carol

About

Smith, N. The terrified women of Joyce Carol Oates. In Allen, M. The necessary blankness p133-59.

Does the library own this? What is the call number?

Please list each step:

Where did you look?_____

What did you look under?_____

If you did not find the item, where did you look next?_____

_____

_____

Elapsed Time:_____

A. What did you look under in the card catalog to find this item?

_____

B. What is the title of the book? _____

C. Did you know that when you started looking in the card catalog for this item?

Yes____ No____

D. Where did you look to find the call number of this item?

_____

_____

_____

Student must:

A. Recognize that the title of the book is The Necessary Blankness and/or that the author is M. Allen.

B. Use the card catalog to determine if we own the book. (For this example the title is the most logical approach, although author approach will work too.)

C. Recognize the call number on the card catalog card.

BEST COPY AVAILA

Circle the student's choice.

1. televised violence
2. bilingual education
3. anorexia nervosa
4. trade unions
5. special interest lobbying
6. The battle at Gettysburg, 1863
7. women managers
8. factors effecting automobile traffic safety

Why did you decide to participate in this study? _____

_____

_____

Library Instruction Dept.
Correction Sheet

Name_____

Date_____

Question			Answers Test 1	Test 2	Test 3	Test 4
1.	Yes____	No____	4A	3C	4A	3C
1A.	Yes____	No____	Find the book?			
1B.	Yes____	No____	Find another book on the same subject?			
1C.	Yes____	No____	YES: bookstack guide; knew in advance		NO: other answers	
1E.	Yes____	No____	YES: subject classification		NO: other answers	
2:1.	Yes____	No____	PR3450.F67	PS3511.A77S7 1938	PN761.M8	TX715.K499
2:2.	Yes____	No____	4A	4A	4A	Sci. Lib.
2A.	Yes____	No____	YES: A/T Cat. under Au or Ti		NO: other answers	
3:1.	Yes____	No____	YES: correct title		NO: other answers	
3:2.	Yes____	No____	YES: correct call number		NO: other answers	
3A.	Yes____	No____	YES: LCSH to Subject Card Catalog		NO: other answers	
4:1.	Yes____	No____	YES: title under appr. heading		NO: other answers	
4:2.	Yes____	No____	YES: correct call number		NO: other answers	
4A.	Yes____	No____	Fate and Fatalism	Brokers	Sensory Deprivation	Termites
4B.	Yes____	No____	YES: subject guide card in catalog		NO: other answers	
5:1.	Yes____	No____	YES: correct title		NO: other answers	
5:2.	Yes____	No____	YES: correct call number		NO: other answers	
5A.	Yes____	No____	YES: Subject Card Cat. under Au,Ti		NO: other answers	
6:1.	Yes____	No____	Yes	No	No	Yes
6:2.	Yes____	No____	AP2.T37	n/a	n/a	K12.A914
6A.	Yes____	No____	YES: journal,magazine,periodical,etc.		NO: other answers	
6B.	Yes____	No____	YES: serials list		NO: other answers	
7:1.	Yes____	No____	YES: title of appr. index,current bib.		NO: other answers	
7:2.	Yes____	No____	YES: title of appr. article		NO: other answers	
8.	Yes____	No____	YES: MLA,Humanities Index,etc.		NO: inappr. indexes	
9:1.	Yes____	No____	YES: yes		NO: no	
9:2.	Yes____	No____	PS374.W6A4	PS3568.0855Z52	PR6060.064L4 1977	PS374.W6A4
9A.	Yes____	No____	YES: A/T Cat. under au or ti		NO: other answers	
9B.	Yes____	No____	YES: correct title		NO: incorrect title	
10.	Yes____	No____	YES: sub. or gen. encyclopedia, book		NO: other answers	
11.	Yes____	No____	YES: current newspaper or weekly		NO: other answers	
12:1.	Yes____	No____	YES: appropriate topic		NO: other answers	
12:2.	Yes____	No____	"		"	
12:3.	Yes____	No____	"		"	
12:1.	Yes____	No____	"		"	
12:2.	Yes____	No____	"		"	
12:3.	Yes____	No____	"		"	
13:1.	Yes____	No____	Yes:Automobiles	Yes:Nuclear	No:Milton	Yes:Handguns
13A.	Yes____	No____	Statistically supportable topics.			
	Yes____	No____	"			
	Yes____	No____	"			
	Yes____	No____	"			
	Yes____	No____	"			
	Yes____	No____	"			

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

UNIVERSITY LIBRARY

5 December 1983

The University of Arizona Library has been awarded a grant to continue the development of our Library Instruction Program. It is our goal to develop the most effective methods possible to teach students how to use library resources and develop information gathering skills.

YOU CAN HELP!

For two hours of your time in the library (doing a directed library exercise) you will receive:

$10.00

and

the satisfaction of giving us information important to our study!

Please fill out the enclosed postcard indicating the time slots which would be most convenient for you. See attached sheet for time slots. We would like to receive the postcard by December 16. The Library will advise you when to come in. Then come to the Central Reference Department of the Main Library at the designated time. Just stop at the desk marked "Library Exercise."

Your social security number is requested to facilitate payment.

If you have questions, please call Louise Greenfield at 621-6413, or Karen Williams at 621-6414. In advance, thank you for your cooperation.

Sincerely yours,

Louise W. Greenfield
Library Instruction Librarian

LWG:lw
Enc.

APPENDIX D:

SELECTED BIBLIOGRAPHY

SELECTED BIBLIOGRAPHY

Amick, Daniel James, "Scientific elitism and the information system of science," Journal of the American Society for Information Science, Sept.-Oct. 1973, 317-27.

Amick discusses the relationship between scientific productivity and scientific elitism. Elites often have a great deal of control over the communication system of their professions; they serve as editors to scientific journals; join professional associations and often participate in the functioning of such; are offered memberships in honorary societies and receive awards. Amick developed ten indicators of scientific elitism, most of which are directly related to the scientific information structure. He also challenged the idea that scientific research can be either basic or applied and suggests instead that it be defined with respect to its position along an analytical continuum from basic to applied. There is a distinct tendency for elites to cluster at the basic research end of the continuum. Amick's study found that: a) the ten variables of elitism provide a scale that successfully discriminates between elites and non-elites; b) elites process more information than non-elites; c) elites had more narrowly defined, less diffuse interest space (scope of interest) than non-elites; and d) elites prefer literature-oriented methods of processing scientific information as opposed to person-oriented methods.

Anderson, Richard O., "Expectations for Entry-Level Biologists: What are State and Provincial Agencies Looking For?" In Sabol, Kenneth (editor), Transactions of the Forty-Seventh North American Wildlife and Natural Resources Conference, held March 26-31, 1982 in Portland, Oregon. Washington, D.C.: Wilddlife Management Institute, 1982, pp. 209-218.

A survey was sent to all chiefs of state and provincial wildlife programs asking for job specifications of entry level professionals with a college education. The articles discusses the results of this survey which emphasize the trend toward increased professionalism in the field, and a growing need for good communication skills. Requested and suggested undergraduate coursework is outlined.

Cookingham, Russell A., and Peter T. Bromley, "Academic Education Needed by Resources Managers," in Transactions of the Forty-fifth North American Wildlife and Natural Resources Conference, held March 22-26, 1980 in Miami Beach, Florida, Washington, D.C.: Wildlife Management Institute, 1980, pp. 45-49.

Dasmann, Raymond F. Wildlife Biology 2nd ed. New York: John Wiley & Sons, 1981.

This book serves as a introduction to the field and was very helpful to us as non-wildlife scholars. By reading the book we were able to gain a basic understanding of the field, pick up some current terminology, discover the goals of wildlife management, learn how the field is organized, and gain insight into what students must learn to become wildlife managers.

Glogoff, Stuart. "Using statistical tests to evaluate library instruction sessions," Journal of Academic Librarianship, 4:438-42, Jan. 1979.

Library instruction evaluation at Penn State has been improved through more objective testing methods such as the use of "t" confidence interval, an analysis of variance, and the chi square test. Methods are discussed and the merits of objectivity in evaluation are examined.

Glueck, William F. and Lawrence R. Jauch, "Sources of research ideas among productive scholars: implications for administrators," "Journal of Higher Education, 46:103-14, 1975.

This study was conducted on the University of Missouri-Columbia campus during 1969-70 and involved 160 hard science researchers. The four sources of ideas mentioned most often by these scientists include the researcher himself, the literature, local colleagues, and professional colleagues elsewhere. Scientists also discussed the need for keeping current both within their specialty areas and adjacent areas of interest. Radical ideas have more difficulty getting published and it was shown that productive scientists are more likely to use their own previous work than non-productive scientists. The study implied that more priority be given to greater emphasis on the maintenance of up-to-date and easily accessible library materials for researchers, and supporting mechanisms for abstracting pertinent literature and information sources.

Hoopes, David T. "New Directions in Career Preparation: The Campus Connection," in Sabol, Kenneth (editor). Transactions of the Forty-Seventh North American Wildlife and Natural Resources Conference, held March 26-31, 1982 in Portland, Oregon. Washington D.C.: Wildlife Management Institute, 1982, pp. 187-193.

Hoopes discusses the changing trends in wildlife and fisheries management and the ways in which undergraduate curricula should prepare students for professional positions. He emphasizes the importance of communication skills, and speaks of the necessity for those in the field to be able to keep up with current research through information retrieval skills.

Hostettler, John D., and others, "Chemical literature exercises and resources," 1982. ERIC document no. ED219266.

A description of Chemical Literature Exercises and Resources (CLEAR), a project designed to make the structure and use of the chemical literature clear to chemistry students. A good source of exercises for chemistry students.

Kirk, Thomas, "The development of course related library and literature use instruction in undergraduate science programs, vols. 1-4," 1977. ERIC document nos. ED152230, ED152231, ED152232, ED152233.

This was a major project which involved several libraries across the country. It is useful to us for studying the attitudes of librarians and faculty members who are involved in teaching library skills to science students. Also a good source of ideas for exercises.

Kitchens, Philip H., "Engineers meet the library," "Journal of Academic Librarianship," 5:277-82, Nov. 1979.

This article describes the program of library use instruction for engineering students at the University of Alabama at Tuscaloosa. It includes details on the motivating factors for this instruction and the specific plan implemented, including objectives, course relationships, library facilities, materials used, operating procedures, and evaluation results.

Kobelski, Pamela and Mary Reichel, "Conceptual Frameworks for Bibliographic Instruction," Journal of Academic Librarianship, 7(2):73-77, May, 1981.

"Conceptual frameworks are general principles drawn from a field of study and used to organize the content of an instructional presentation." This paper discusses the importance of conceptual frameworks to bibliographic instruction and presents the seven major frameworks in use in libraries today. These frameworks draw on educational theory and can be used to make library instruction more efficient, effective, and relative to students.

Moskowitz, Mickey, "Developing a microcomputer program to evaluate library instruction," "School Library Media Quarterly," 10:351-6, Summer 1982.

A computer program designed to organize and report the data needed to evaluate library orientation.

Nettlefold, Brian A., "A course in communication and information retrieval for undergraduate biologists," "Journal of Biological Education," 9:201-205, 1975.

This article describes a course in Communication and Information Retrieval required of biology majors at Paisley College of Technology. The course covers the structure of scientific literature, the language barrier, techniques of literature searching and scientific writing, and the information network in the life sciences.

Pritchard, Eileen, "Library and classroom exercises in science," 1980. ERIC document number ED188910.

Provided are ten student exercises designed for orientations in the sciences, particularly biology. This might prove useful as a source of ideas for exercises.

Rickwood, Peter C., "Introducing university students to the geological literature," "Journal of Geological Education," 23:103-06, 1975.

An outline of the methods used by professors at the University of New Wales, Australia to introduce geology students to the literature. Might be used as a source of ideas for exercises.

Schirmer, Robert and G. Charles Newman, "Library and information retrieval instruction: competency testing," College and Research Libraries News, no. 8:259-62, Sept. 1982.

At Findlay College in Ohio students must meet competency requirements in several areas including library and information retrieval skills. This article discusses the philosophy behind competency testing and how the competency requirement in library skills is met by students. Useful as background information on the issue of competency requirements.

Skelton, Barbara, "Scientists and social scientists as information users: a comparison of results of science user studies with the investigation into information requirements of the social sciences," Journal of Librarianship, 5:138-56, 1973.

This paper draws a very useful profile of the scientist as an information user. Skelton's conclusions are based on the results of a selection of science user studies and the investigation into Information Requirements of the Social Sciences (INFROSS). (The paper is a comparison of information seeking behavior of scientists and social scientists.) Skelton has determined that scientists make heavy use of journal articles and trade literature but they don't consider theses and research reports to be particularly important. The methods most often used by scientists for retrieving information include known

citations, abstracting and indexing journals, personal recommendations and chance. Scientists use the library to obtain information but not to identify information in most instances. Pure scientists are said to use the library more often than applied scientists; and there are differences in the information seeking behavior of scientists working in different disciplines or having different job functions. Those scientists engaged in industrial or government research are more likely to conduct research on broader topics.

Smalley, Topsy N. and Stephen H. Plum, "Teaching library researching in the humanities and the sciences: A contextual approach," in Oberman, Cerise, ed., Theories of Bibliographic Education. New York: Bowker, 1982 pp. 135-70.

The authors point out the differences between the ways in which humanists and scientists go about conducting research, publishing, and seeking information. They use these concepts as frameworks for teaching library skills to students within their respective disciplines. Humanist methodology is said to be interpretive, intuitive, and focused on examination of particulars. The major vehicle for publishing informaton in the humanities is the monograph, and most of these are authored by only one person. Students in humanities fields are encouraged to critically evaluate all information retrieved, as it is assumed that not everything written about a particular area will be relevant to what they are are studying. On the other hand, scientific method is said to focus on close examination of regularities. The journal article is the most important source of information in the sciences, where the cumulative effect of knowledge is more evident and currency is of the utmost importance. Science students are encouraged to conduct exhaustive literature searches as it is assumed that everything previously published will be relevant to current research. Scientists most often work in groups and multiple authorship of a document is the norm.

Sparrowe, Rollin D., "Influence of Cooperative Wildlife and Fishery Units on Graduate Education and Progessional Employment," in Sabol, Kenneth (editor). Transactions of the Forty-seventh North American Wildlife and Natural Resources Conference, held March 26-31, 1982 in Portland, Oregon. Washington, D.C.: Wildlife Management Institute, 1982, pp. 219-230.

Stoan, Stephen K., "Research and Library Skills: An Analysis and Interpretation," College and Research Libraries 45(2):99-109, March 1984.

Williams, Esther, "Introduction to Science Literature: A Library Assignment for General Biology Students," Research Strategies, 2(2):65-70, Spring 1984.

This paper presents a library assignment for beginning biology students which we thought very useful. We adapted the portion of the assignment which addressed the distinctions between popular and scholarly articles and used this with the wildlife and fisheries students. It was very

effective in making the students aware of the differences between the two types of articles.

Winship, Ian, "Physics students and information sources," Physics Education, 11:362-64, 1976.

A description of the library teaching programme for physics students at Newcastle upon Tyne Polytechnic.

Woolpy, Jerome H., "Information Retrieval for Introductory Science Courses," The American Biology Teacher pp. 162+ March, 1977.

Wood, D.N. and K.P. Barr, "Courses on the Structure and Use of Scientific Literature," Journal of Documentation 22(1):22-32, March, 1966.

This article describes courses on the structure and use of scientific literature which have been run at the National Lending Library. Also included is a brief account of a meeting between university librarians to discuss the organization of similar courses in British universities.

Zuckerman, Harriet, and Robert K. Merton, "Age, aging, and age structure in science," in Matilda White Riley, Marilyn Johnson, and Anne Foner, Aging and Society, v.3: A Sociology of Age Stratification, New York: Russell Sage Foundation, 1972, pages 292-356.

It takes approximately eleven years from the time of entry into a college to receive a doctorate in a scientific discipline, which results in an increase in the median age of scientists. The authors report that a slackened increase in resources will mean fewer new research installations and new departments in universities. The age structure of research groups will be reflected in the productivity level. The rate of increase in the volume of scientific publications will tend to diminish but this need not mean a decline in the growth of knowledge.

The authors discuss the concept of codification which refers to the consolidation of empirical knowledge into succinct and interdependent theoretical formulations. The intellectual organization of the different disciplines differs in the extent to which particulars are knit together by general ideas. The extent of codification of a science should affect the modes of gaining competence in it. Experience should count more heavily in the less codified fields.

An informative discussion of the concept of age stratification and the sociology of science.